

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY

HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

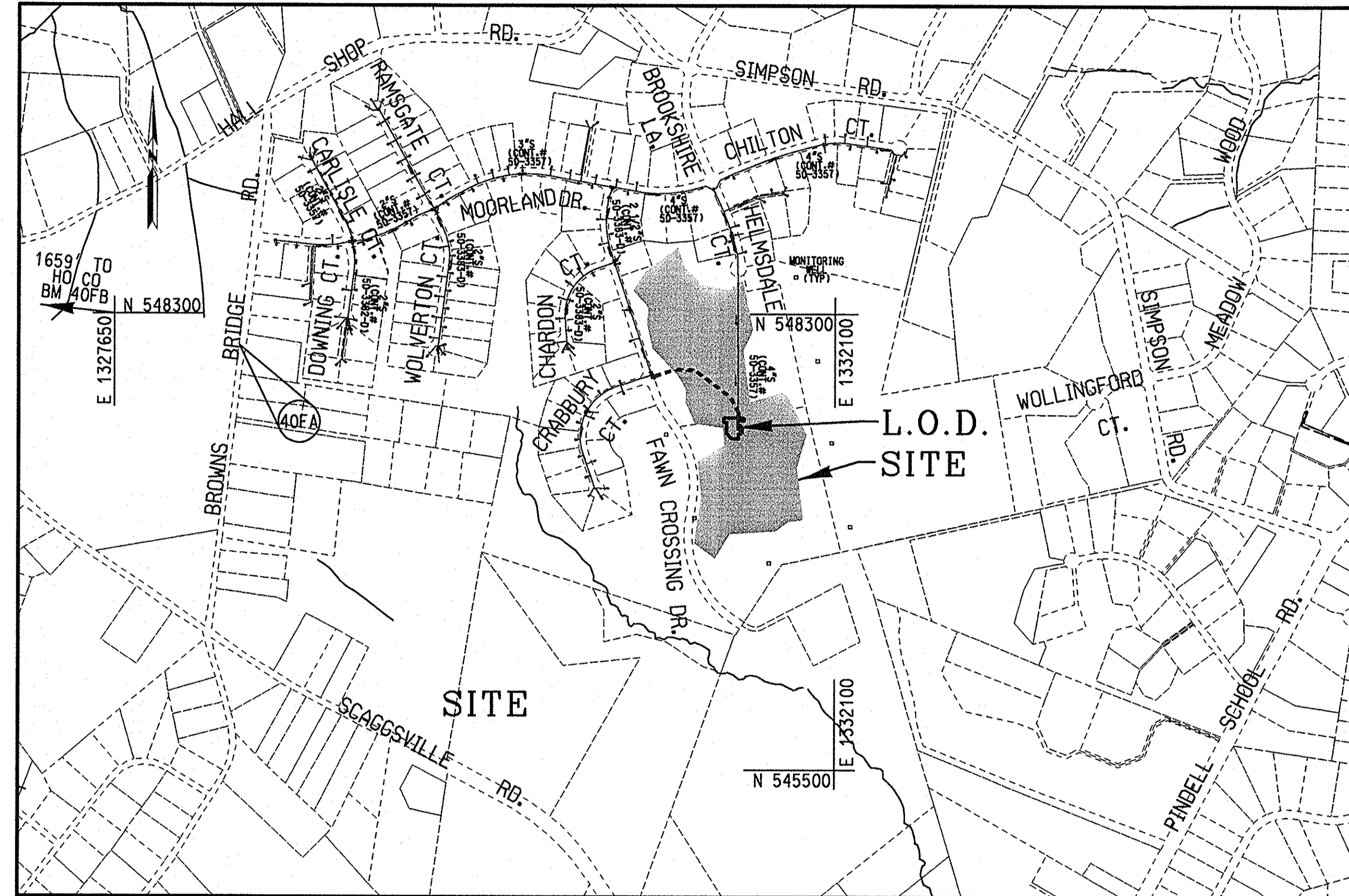
CAPITAL PROJECT No. S-6269

CONTRACT No. 50-4972

GENERAL NOTES

1. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
2. EXISTING FEATURES ON THESE PLANS HAVE BEEN DEVELOPED BY KCI TECHNOLOGIES USING PLANS FOR THE ASHLEIGH KNOLLS WASTEWATER COLLECTION, TREATMENT AND DISPOSAL SYSTEM (CONTRACT NO. 50-3357) DATED AUGUST 1994. NO TOPOGRAPHIC SURVEY WAS CONDUCTED FOR THIS CONTRACT. THE DATUM ON THE AS BUILT (CONTRACT NO. 50-3357): THE HORIZONTAL DATUM IS BASED ON MARYLAND STATE COORDINATES NAD 83/91. THE VERTICAL DATUM IS BASED ON U.S.G.S NGVD 29.
3. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
4. CLEAR ALL UTILITIES BY A MINIMUM OF 12".
5. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
6. CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

AT&T.....	1-800-252-1133
BGA (CONSTRUCTION SERVICES).....	410-637-8713 / 800-233-1854
BGA (EMERGENCY).....	800-685-0123
BUREAU OF UTILITIES (BPU).....	410-313-4900
COLONIAL PIPELINE CO.	410-795-1390 / 800-926-2728
MISS UTILITY.....	1-800-257-7777
STATE HIGHWAY ADMINISTRATION.....	410-313-7450 / 410-582-5650
VERIZON.....	1-800-743-0033 / 410-224-8210
7. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
8. CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SITE WORK.
9. EXCEPT AS INDICATED ON THE PLANS AND NOTED ABOVE, ALL PUBLIC WATER MAINS SHALL BE POLYVINYLCHLORIDE (PVC) PIPE MEETING THE REQUIREMENTS OF AWWA C900 DR18. PRESSURE CLASS 150 AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV-STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.
10. THE CONTRACTOR SHALL NOT OPERATE ANY STATION EQUIPMENT ON THE EXISTING TREATMENT SYSTEM. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF UTILITIES HOWARD COUNTY, 15 DAYS PRIOR TO WATER MAIN SHUT DOWNS.
11. THE CONTRACTOR SHALL PROVIDE SURVEY CONSTRUCTION STAKEOUT FOR ALL NECESSARY LINES, GRADES AND ELEVATION OF THE PROPOSED FACILITIES.
12. THE CONTRACTOR SHALL PROVIDE STAGING/STORAGE AREA.
13. ALL EXCAVATION SHALL BE KEPT FREE OF WATER UNTIL BACKFILL IS PROPERLY TAMPED IN PLACE TO FINISHED GRADE.
14. THE CONTRACTOR SHALL COORDINATE WITH THE EXISTING SYSTEM. ALL CONNECTIONS TO THE EXISTING SYSTEM SHALL BE PERFORMED DURING LOW WASTEWATER FLOW CONDITION, AS APPROVED BY THE COUNTY, TO MINIMIZE THE DISRUPTION TO THE OPERATION OF THE EXISTING SYSTEM.



VICINITY MAP

SCALE: 1" = 600'

DIRECTIONS: FROM I-95 SOUTH TO ROUTE 216 WEST, MAKE A RIGHT ONTO BROWN BRIDGE ROAD, RIGHT ON MOORLAND DRIVE AND A RIGHT ON FAWN CROSSING DRIVE. SITE ENTRANCE ROAD ON LEFT.

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4	C-2	PROPOSED SITE PLAN & SEDIMENT AND EROSION CONTROL PLAN
5	C-3	SITE PIPING PLAN
6	C-4	EQUALIZATION TANK
7	C-5	SITE PIPING PROFILES
8	C-6	SITE PIPING PROFILES
9	C-7	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
10	A-1	BUILDING PLAN
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12	A-3	REFLECTED CEILING PLAN
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20	M-4	PLUMBING - POTABLE & NON POTABLE WATER SYSTEM
21	M-5	HVAC PLAN AND CRITERIA
22	M-6	HVAC SCHEDULES AND DETAILS
23	M-7	MECHANICAL DETAILS
24	E-0	ELECTRICAL GENERAL NOTES, SYMBOLS AND ABBREVIATIONS
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26	E-2	ELECTRICAL POWER BUILDING LAYOUT
27	E-3	ELECTRICAL LIGHTING BUILDING LAYOUT
28	E-4	ELECTRICAL SCHEDULES
29	E-5	ELECTRICAL ONE-LINE
30	E-6	ELECTRICAL DETAILS I
30A	E-7	ELECTRICAL DETAILS II
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32	I-2	INSTRUMENTATION SYMBOLS
33	I-3	INSTRUMENTATION SITE PLAN
34	I-4	INFLUENT TRANSFER PUMP STATION P & ID
35	I-5	SEQUENCING BATCH REACTOR P & ID
36	I-6	AUXILIARY SYSTEMS P & ID
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38	I-8	WIRING DIAGRAM - 1
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40	I-10	WIRING DIAGRAM - 3
41	I-11	WIRING DIAGRAM - 4
42	I-12	VENTILATION CONTROLS
43	I-13	GENERATOR CONTROLS

OWNER'S ADDRESS

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF UTILITIES
8250 OLD MONTGOMERY ROAD
COLUMBIA MARYLAND, 21045

OWNERS / DEVELOPER CERTIFICATION

"I/WE CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO THE BEGINNING OF THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

Amy Hunt 3-23-17
OWNER'S / DEVELOPER'S SIGNATURE DATE

Project Manager
PRINTED NAME & TITLE

DESIGN CERTIFICATION

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

Guihua Wang
DESIGNER'S SIGNATURE DATE
GUIHUA WANG
PRINTED NAME
MD REGISTRATION NO. 31363
(P.E., R.L.S. OR R.L.A. (CIRCLE ONE))

TYPE OF BUILDING:	UTILITY
NUMBER OF PARCELS:	109
NUMBER OF WATER HOUSE CONNECTIONS:	0
NUMBER OF SEWER HOUSE CONNECTIONS:	0
DRAINAGE AREA:	NOT APPLICABLE
TREATMENT PLANT:	ASHLEIGH KNOLLS

HORIZONTAL AND VERTICAL CONTROL USED IN CONTRACT NO. 50-3357
BASED ON MARYLAND NAD 83/91 (HORIZONTAL) AND NGVD 29 (VERTICAL) DATUM.
HOWARD COUNTY GEODETIC SURVEY CONTROL NUMBERS:

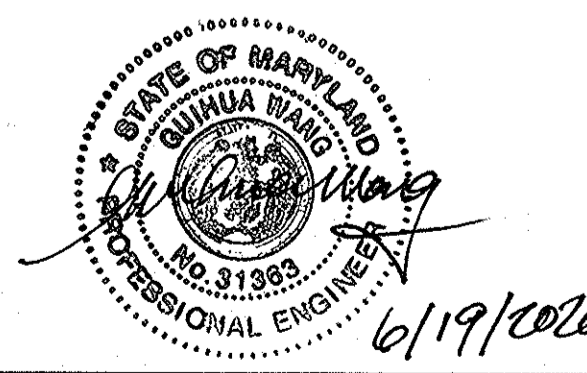
NO. 40FA	NO. 40FB
N 548106.87	N 548478.32
E 1328421.4	E 132600.81
ELEV. 497.648	ELEV. 505.297

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Guihua Wang 3/28/17
HOWARD SOIL CONSERVATION DISTRICT DATE
EP-16-04

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 31363 EXPIRATION DATE: 01/16/2022

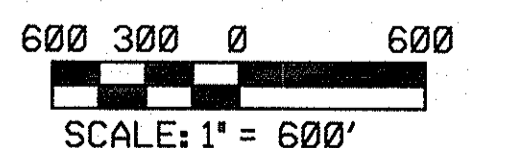


AS-BUILT CERTIFICATION

I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this plan were constructed as shown on this "AS-BUILT" plan meet the Approved Plans and Specifications.

Signature: _____
Design Professional Signature
Date: 12/06/2021 MD P.E. License: 31363

GRAPHIC SCALE



AS-BUILT REPLACEMENT SHEET 12/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James & Butler 2/17
DATE
2/17/17
DATE

James & Butler 2/17
DATE
2/17/17
DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI
TECHNOLOGIES

936 RECORDER ROAD
SHAW'S MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com

PROFESSIONAL ENGINEER
STATE OF MARYLAND
GUIHUA WANG
NO. 31363
EXPIRES 01/16/2022

DES: KFJ			
DRN: KFJ			
CHK: GW	KJ	AS-BUILT	12/21
DATE: AUG., 2016	JFW	ELECTRICAL DESIGN UPDATES	6/20
	GW	NOVEMBER 21, 2018	
	BY	NO.	REVISION

TITLE SHEET

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

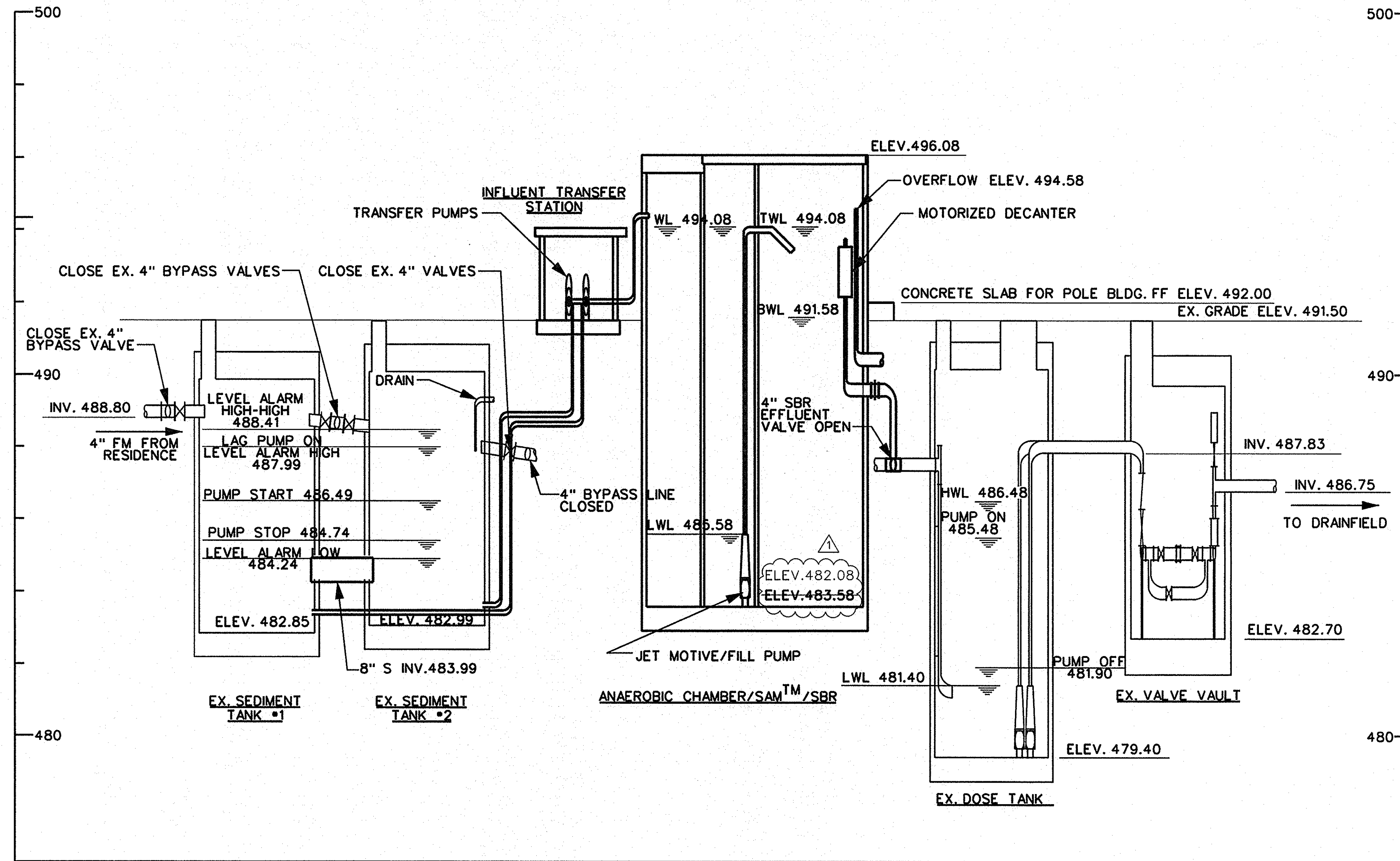
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

G-1
SCALE AS SHOWN
SHEET
1 of 43

DESIGN CRITERIA

WASTEWATER FLOW:		
AVERAGE DAILY FLOW:	24,525	GPD
MAXIMUM DAILY FLOW (PERMIT):	32,700	GPD
EQUALIZATION TANK:		
USE EXISTING SEDIMENTATION TANKS #1 & #2	6,400	GALLON
EFFECTIVE EQUALIZATION VOLUME:		
SBR INFLUENT TRANSFER PUMPS:		
NO. OF PUMPS:	2 (ONE DUTY, ONE STANDBY)	
DESIGN POINT:	17.03 GPM @ 10.6 FT	
	34.06 GPM @ 15.1 FT	
SBR DESIGN CRITERIA:		
DESIGN FLOW:	24,545	GPD
MAX DAY FLOW:	49,050	GPD
TEMPERATURE:	25	C (SUMMER)
	12	C (WINTER)
AMBIENT TEMPERATURE:	38	C (SUMMER)
	-18	C (WINTER)
SBR INFLUENT CHARACTERISTICS:		
BOD ₅ :	200	MG/L
TSS:	50	MG/L
TKN:	51	MG/L
NH ₄ ⁺ -N:	43	MG/L
NO ₃ ⁻ -N:	0.1	MG/L
TP:	7.4	MG/L
* BASED ON THE SAMPLE AFTER THE FIRST SEDIMENTATION TANK.		
SBR EFFLUENT DESIGN CRITERIA:		
BOD ₅ :	20	MG/L
TSS:	20	MG/L
TN:	8	MG/L
SBR SYSTEM DESIGN:		
NO. OF BASIN:	1	
MLSS:	2,500	MG/L
SRT (SBR):	19	DAYS
SRT (SBR + SAM):	23	DAYS
HRT (SBR):	14.5	HRS
CYCLE TIME @ ADF		
FILL	0.37	HRS
AERATION	1.93	HRS
ANOXIC	2.27	HRS
SETTLE	0.75	HRS
DECANT	0.68	HRS
CYCLE TIME @ MAX DAY FLOW		
FILL + AERATION	3.45	HRS
ANOXIC	1.12	HRS
SETTLE	0.75	HRS
DECANT	0.68	HRS
STANDARD OXYGEN REQUIRED @ ADF		
STANDARD OXYGEN REQUIRED @ MAX DAY FLOW	69	LBS/DAY
DECANT FLOW:	150	GPM
EX. DOSING PUMP FLOW RATE:	330	GPM
CHEMICAL DOSING PUMPS		
MICRO-C PUMP:	DESIGN FLOW 0.25 L/HR @ 5 PSIG	
CAUSTIC (25% NaOH) PUMP:	DESIGN FLOW 0.14 L/HR @ 5 PSIG	
SODIUM HYPOCHLORITE PUMP:	DESIGN FLOW 0.14 L/HR @ 50 PSIG	
UNITS OF EACH TYPE CHEMICAL PUMP:		
	ONE DUTY, ONE SHELF SPARE	
pH CONTROLLER SET POINT:		
	pH = 6.5 (FOR CAUSTIC ADDITION)	



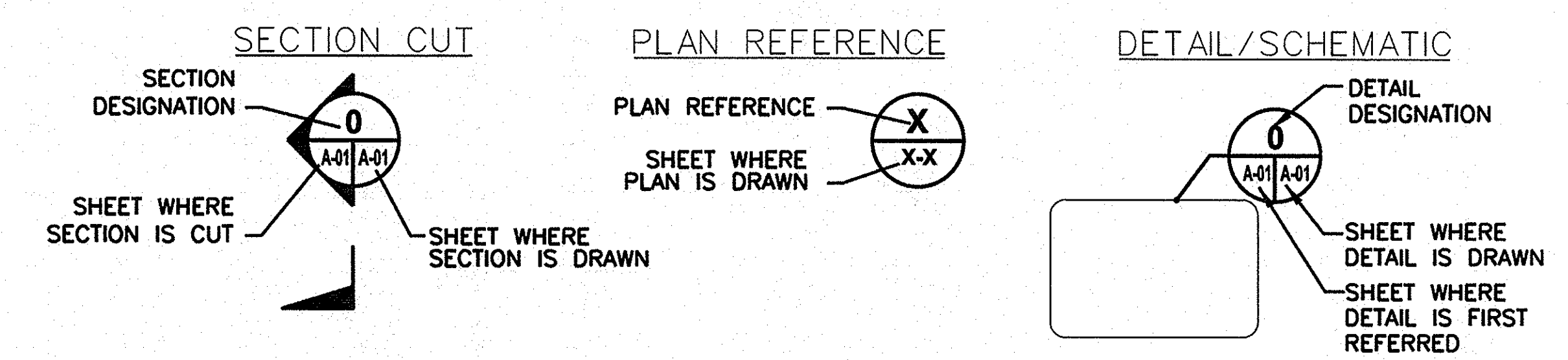
LEGEND

- EXISTING FEATURES
- PROPOSED FEATURES

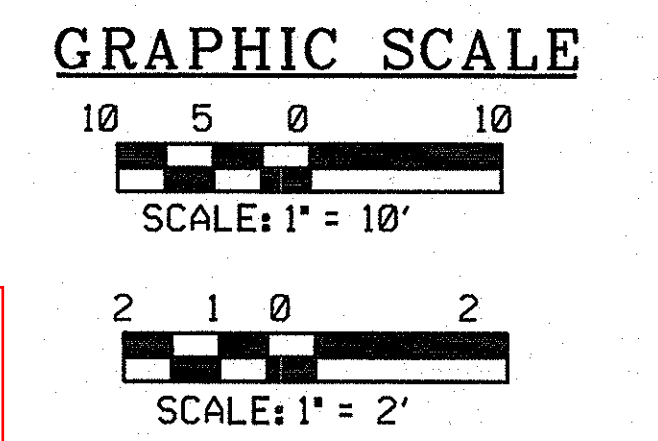
ABBREVIATIONS

- ADF AVERAGE DAILY FLOW
- BWL BOTTOM WATER LEVEL
- D.I.P. DUCTILE IRON PIPE
- EX. EXISTING
- FM FORCE MAIN
- HRT HYDRAULIC RETENTION TIME
- HWL HIGH WATER LEVEL
- INV INVERT
- SAMTM SURGE/ANOXIC/MIX
- SBR SEQUENCING BATCH REACTOR
- SRT SLUDGE RETENTION TIME
- WL WATER LEVEL
- TWL TOP WATER LEVEL

1 PROFILE
SCALE: HORZ. - 1" = 10'
VERT. - 1" = 2'

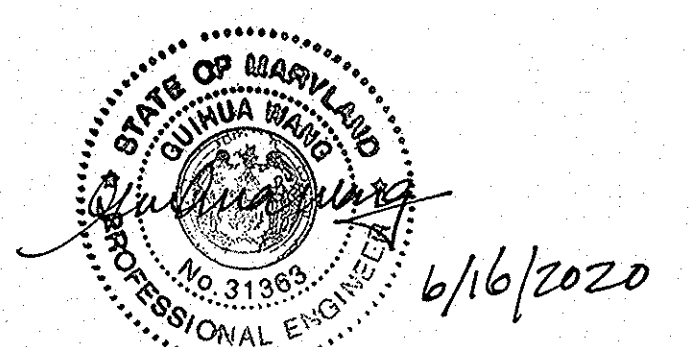


A DRAWING SYMBOLS
SCALE: NONE



AS-BUILT
DATE 12/2021

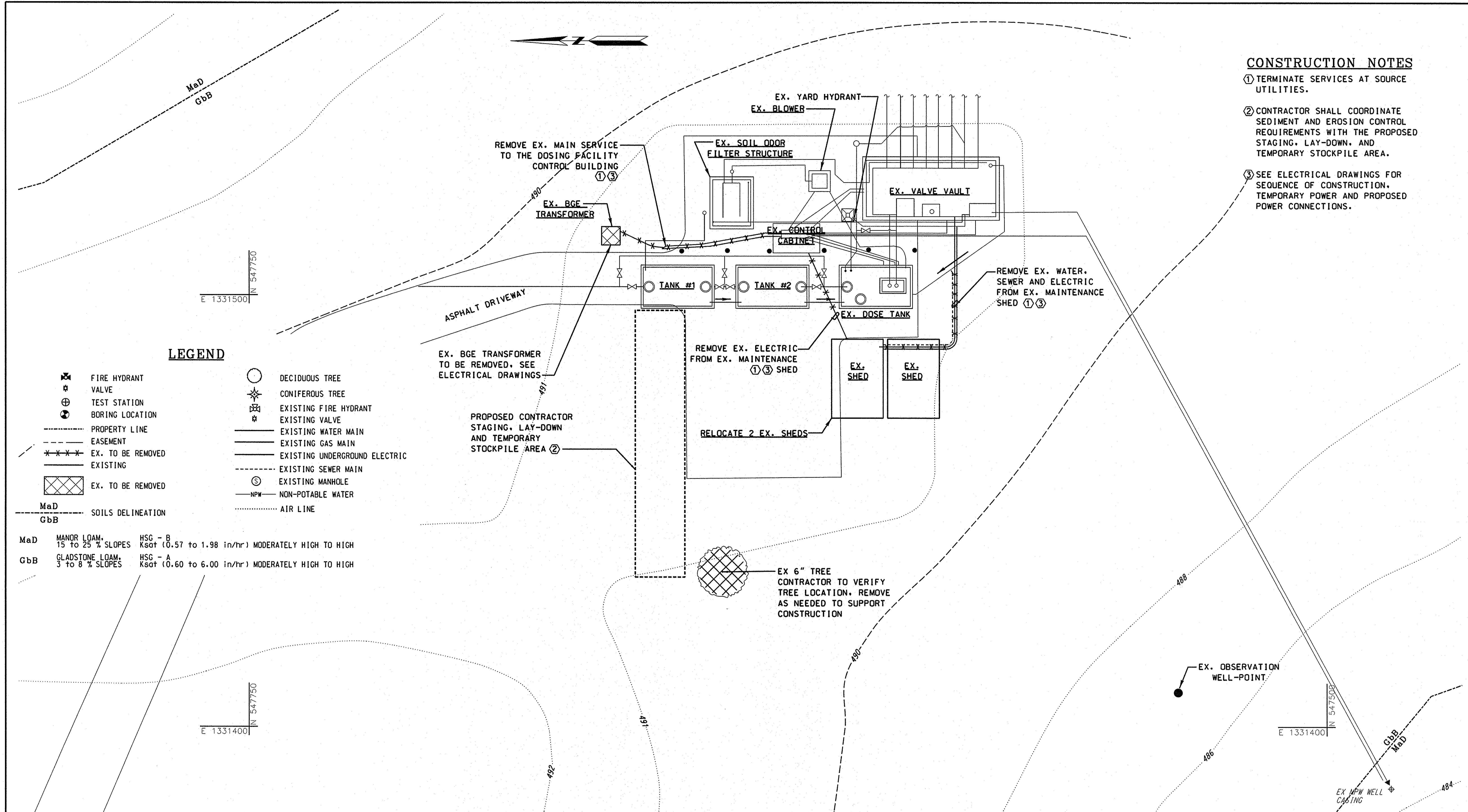
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 31363 EXPIRATION DATE: 01/16/2022



<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>Janet...</i> 2/16/21 DIRECTOR OF PUBLIC WORKS</p> <p><i>Thomas S. Butler</i> 2/17/21 CHIEF, BUREAU OF ENGINEERING</p> <p><i>...</i> 2/18/21 CHIEF, UTILITY DESIGN DIVISION</p>	<p>ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS</p> <p>KCI TECHNOLOGIES</p> <p>936 RIDGEBROOK ROAD SHEPHERD, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com</p>	<p>STATE OF MARYLAND PROFESSIONAL ENGINEER No. 31363 6/16/2020</p>	<p>DES: KFJ</p> <p>DRN: KFJ</p> <p>CHK: GW</p> <p>DATE: NOVEMBER 21, 2018</p> <p>BY NO. REVISION</p>	<p>HYDRAULIC PROFILE</p>	<p>ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972</p> <p>ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND</p>	<p>G-2</p> <p>SCALE AS SHOWN</p> <p>SHEET 2 OF 43</p>
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CONSTRUCTION NOTES

- ① TERMINATE SERVICES AT SOURCE UTILITIES.
- ② CONTRACTOR SHALL COORDINATE SEDIMENT AND EROSION CONTROL REQUIREMENTS WITH THE PROPOSED STAGING, LAY-DOWN, AND TEMPORARY STOCKPILE AREA.
- ③ SEE ELECTRICAL DRAWINGS FOR SEQUENCE OF CONSTRUCTION, TEMPORARY POWER AND PROPOSED POWER CONNECTIONS.



LEGEND

- FIRE HYDRANT
- VALVE
- TEST STATION
- BORING LOCATION
- PROPERTY LINE
- EASEMENT
- EX. TO BE REMOVED
- EXISTING
- EX. TO BE REMOVED
- SOILS DELINEATION
- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING FIRE HYDRANT
- EXISTING VALVE
- EXISTING WATER MAIN
- EXISTING GAS MAIN
- EXISTING UNDERGROUND ELECTRIC
- EXISTING SEWER MAIN
- EXISTING MANHOLE
- NON-POTABLE WATER
- AIR LINE

MaD MANOR LOAM. HSG - B
15 to 25 % SLOPES Ksat (0.57 to 1.98 in/hr) MODERATELY HIGH TO HIGH

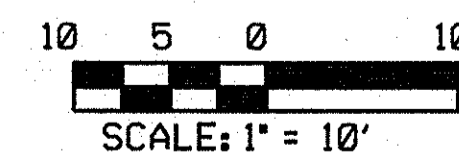
GbB GLADSTONE LOAM. HSG - A
3 to 8 % SLOPES Ksat (0.60 to 6.00 in/hr) MODERATELY HIGH TO HIGH

NOTE:
THERE ARE NO STEEP AND HIGHLY ERODIBLE SOILS WITHIN THE WORK SITE AREA.



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1 EXISTING SITE PLAN
C-1 SCALE: 1"=10'



AS-BUILT
DATE 12/2021

PLOTTED: 08/11/2016 10:00 AM

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James E. Butler 2/17
DIRECTOR OF PUBLIC WORKS DATE

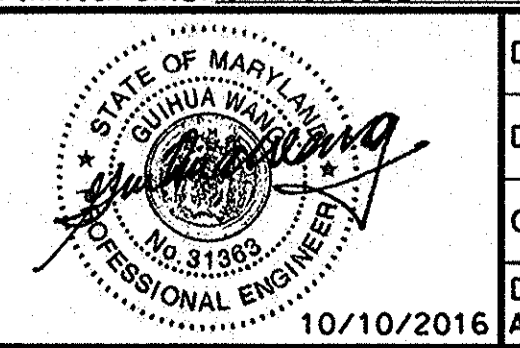
Thomas E. Butler 2/17
CHIEF, BUREAU OF ENGINEERING DATE

Thomas E. Butler 2/17
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

936 RIDGEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com



DES: KFJ					
DRN: KFJ					
CHK: GW					
DATE: AUG. 2016	BY	NO.	REVISION	DATE	

EXISTING SITE PLAN & SOILS MAP

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

C-1
SCALE AS SHOWN
SHEET 3 OF 43

ADDITIONAL IMPERVIOUS AREA CALCULATIONS

①	SBR FACILITY	1,590	S.F.
②	ASPHALT DRIVE	2,751	S.F.
③	CONCRETE SIDEWALKS	387	S.F.
TOTAL:		4,728	S.F.

LEGEND

- | | | | |
|--|------------------------------|--|-------------------------------|
| | FIRE HYDRANT | | DECIDUOUS TREE |
| | VALVE | | CONIFEROUS TREE |
| | TEST STATION | | EXISTING FIRE HYDRANT |
| | BORING LOCATION | | EXISTING VALVE |
| | LIMIT OF DISTURBANCE | | EXISTING WATER MAIN |
| | SILT FENCE | | EXISTING GAS MAIN |
| | PROPERTY LINE | | EXISTING UNDERGROUND ELECTRIC |
| | EASEMENT | | EXISTING SEWER MAIN |
| | TEMPORARY CONSTRUCTION STRIP | | EXISTING MANHOLE |
| | ASPHALT PAVING | | NON-POTABLE WATER |
| | CONCRETE SIDEWALK | | POTABLE WATER |
| | | | AIR LINE |
| | | | EXISTING |
| | | | PROPOSED |

① NEW TRANSFORMER & SERVICE ENTRANCE

E 1331509.82
N 547665.21

E 1331509.80
N 547677.14

E 1331497.77
N 547668.43

E 1331492.41
N 547633.66

E 1331478.41
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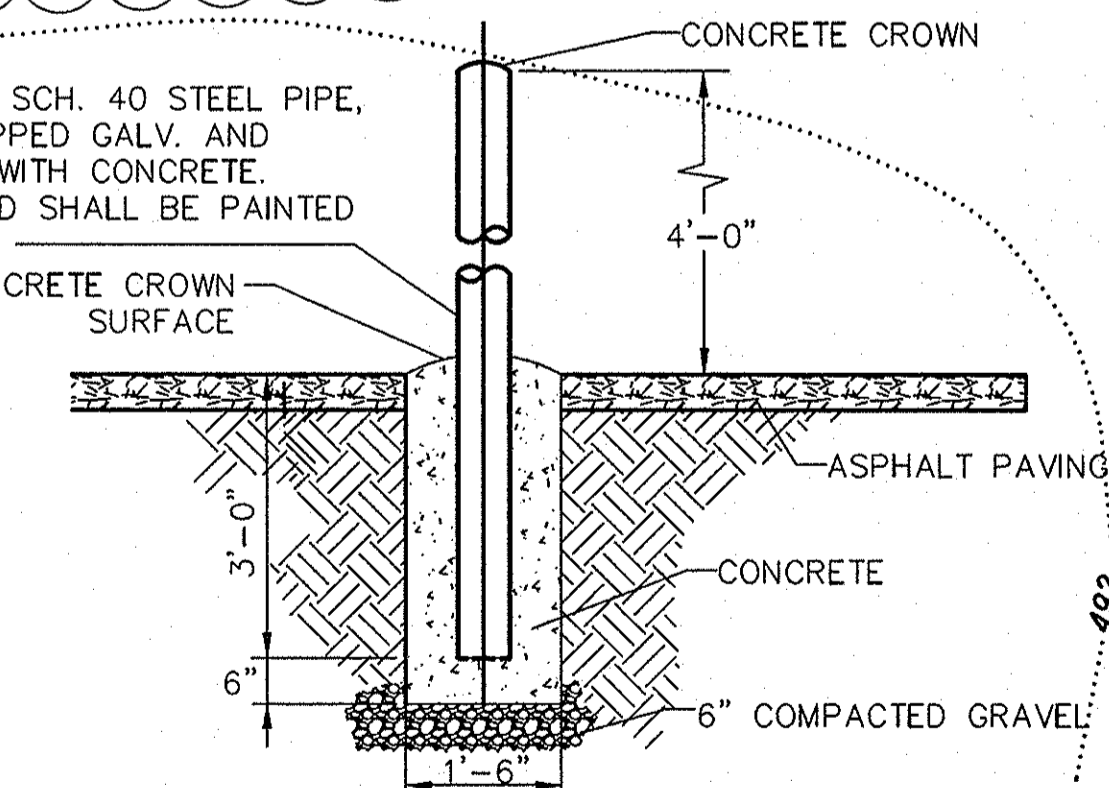
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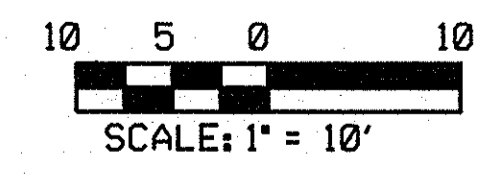
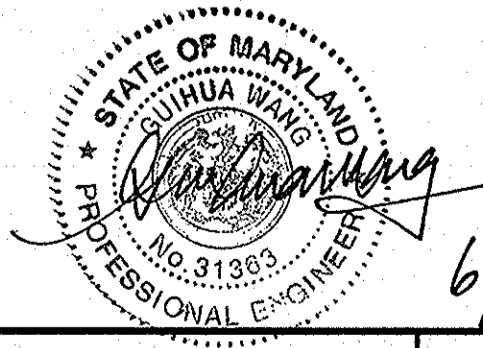
THE CONTRACTOR SHALL PROVIDE PRECAST CONCRETE PARKING BUMPERS OF HALF OCTAGONAL CONFIGURATIONS WITH A DIMENSION OF 7'-0"(L)x8"(W)x7"(H). BUMPERS SHALL BE MANUFACTURED USING 5,000 PSI CONCRETE (28-DAY STRENGTH). EACH BUMPER SHALL BE REINFORCED WITH A MINIMUM OF TWO NO. 4 DEFORMED STEEL REINFORCING BARS. EACH BUMPER INSTALLED ON AT-GRADE ASPHALT PAVEMENT SHALL BE MANUFACTURED WITH TWO HOLES TO ACCOMMODATE THE INSTALLATION OF STAINLESS STEEL REBAR. HOLES SHALL BE POSITIONED 6" FROM EACH END.



① BOLLARD DETAIL
C-1

① SITE PLAN
C-2 SCALE: 1"=10'

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OWNER'S ADDRESS
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF UTILITIES
8250 OLD MONTGOMERY ROAD
COLUMBIA MARYLAND, 20145

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/15/20
DIRECTOR OF PUBLIC WORKS
DATE

[Signature] 2/15/20
CHIEF, BUREAU OF UTILITIES
DATE

[Signature] 2/15/20
CHIEF, UTILITY DESIGN DIVISION
DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI
TECHNOLOGIES

936 RIDGEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
WWW.KCI.COM

10/10/2016

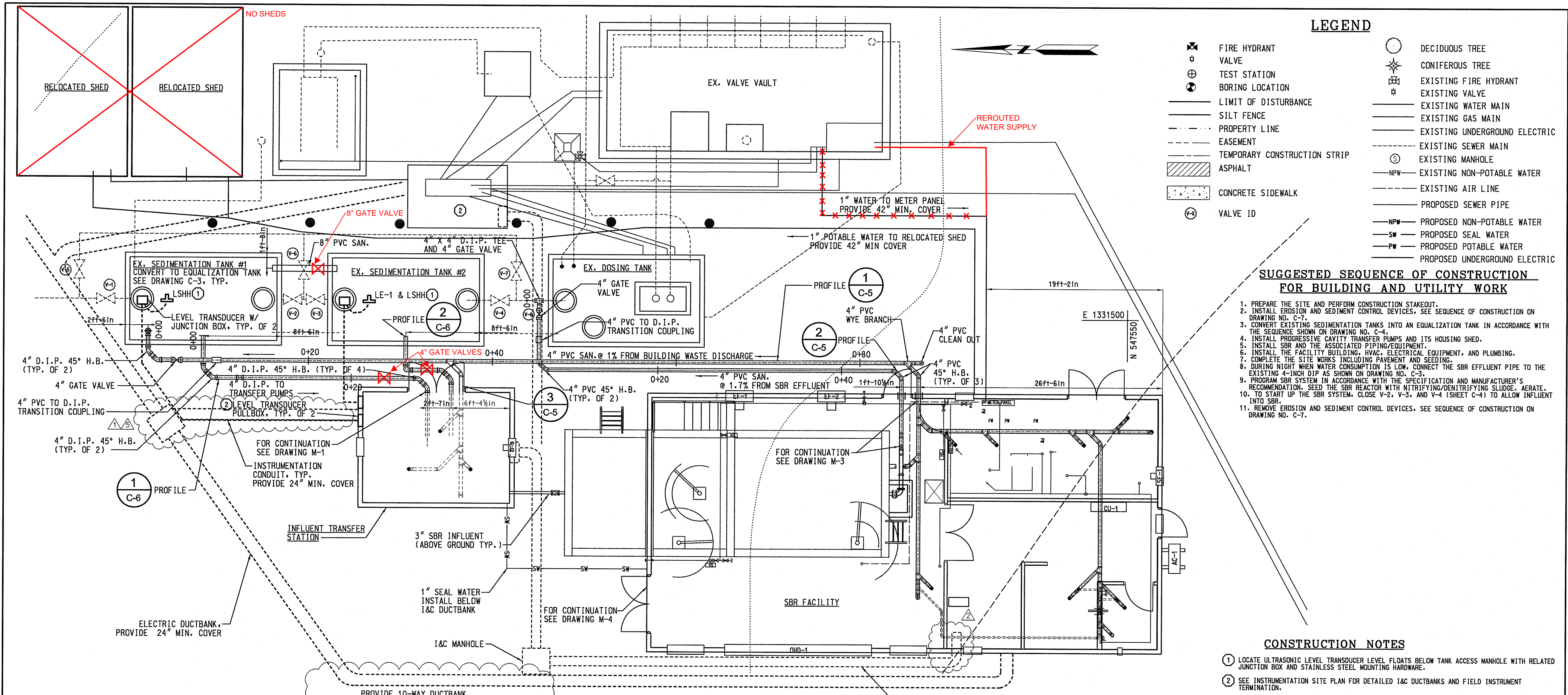
DES:	KFJ			
DRN:	KFJ			
CHK:	GW	KJ	AS-BUILT	12/21
DATE:	NOVEMBER 21, 2018	GW		
AUG. 2016		BY	NO.	REVISION

PROPOSED SITE PLAN & SEDIMENT AND EROSION CONTROL PLAN

DATE: 600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

C-2
SCALE AS SHOWN
SHEET
4 OF 43



- ### LEGEND
- FIRE HYDRANT
 - VALVE
 - TEST STATION
 - BORING LOCATION
 - LIMIT OF DISTURBANCE
 - SILT FENCE
 - PROPERTY LINE
 - EASEMENT
 - TEMPORARY CONSTRUCTION STRIP
 - ASPHALT
 - CONCRETE SIDEWALK
 - VALVE ID
 - DECIDUOUS TREE
 - CONIFEROUS TREE
 - EXISTING FIRE HYDRANT
 - EXISTING VALVE
 - EXISTING WATER MAIN
 - EXISTING GAS MAIN
 - EXISTING UNDERGROUND ELECTRIC
 - EXISTING SEWER MAIN
 - EXISTING MANHOLE
 - EXISTING NON-POTABLE WATER
 - EXISTING AIR LINE
 - PROPOSED SEWER PIPE
 - PROPOSED NON-POTABLE WATER
 - PROPOSED SEAL WATER
 - PROPOSED POTABLE WATER
 - PROPOSED UNDERGROUND ELECTRIC

SUGGESTED SEQUENCE OF CONSTRUCTION FOR BUILDING AND UTILITY WORK

1. PREPARE THE SITE AND PERFORM CONSTRUCTION STAKEOUT.
2. INSTALL EROSION AND SEDIMENT CONTROL DEVICES. SEE SEQUENCE OF CONSTRUCTION ON DRAWING NO. C-7.
3. CONVERT EXISTING SEDIMENTATION TANKS INTO AN EQUALIZATION TANK IN ACCORDANCE WITH THE SEQUENCE SHOWN ON DRAWING NO. C-4.
4. INSTALL PROGRESSIVE CAVITY TRANSFER PUMPS AND ITS HOUSING SHED.
5. INSTALL SBR AND THE ASSOCIATED PIPING/EQUIPMENT.
6. INSTALL THE FACILITY BUILDING, HVAC, ELECTRICAL EQUIPMENT, AND PLUMBING.
7. COMPLETE THE SITE WORKS INCLUDING PAVEMENT AND SEEDING.
8. DURING NIGHT WHEN WATER CONSUMPTION IS LOW, CONNECT THE SBR EFFLUENT PIPE TO THE EXISTING 4-INCH DIP AS SHOWN ON DRAWING NO. C-3.
9. PROGRAM SBR SYSTEM IN ACCORDANCE WITH THE SPECIFICATION AND MANUFACTURER'S RECOMMENDATION. SEED THE SBR REACTOR WITH NITRIFYING/DENITRIFYING SLUDGE. AERATE.
10. TO START UP THE SBR SYSTEM, CLOSE V-2, V-3, AND V-4 (SHEET C-4) TO ALLOW INFLUENT INTO SBR.
11. REMOVE EROSION AND SEDIMENT CONTROL DEVICES. SEE SEQUENCE OF CONSTRUCTION ON DRAWING NO. C-7.

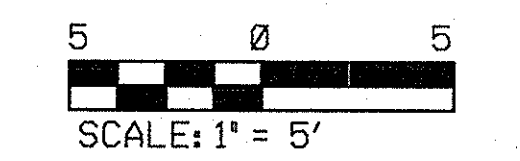
CONSTRUCTION NOTES

- ① LOCATE ULTRASONIC LEVEL TRANSDUCER LEVEL FLOATS BELOW TANK ACCESS MANHOLE WITH RELATED JUNCTION BOX AND STAINLESS STEEL MOUNTING HARDWARE.
- ② SEE INSTRUMENTATION SITE PLAN FOR DETAILED I&C DUCTBANKS AND FIELD INSTRUMENT TERMINATION.
- ③ SEE ELECTRICAL DRAWINGS FOR DETAILED ELECTRICAL SERVICE DUCTBANKS AND SERVICE ENTRANCE DETAILS.

BYPASS OPTIONS

1. NORMAL OPERATION:
CLOSE V-2, V-3, V-4, V-5, V-6, V-7
OPEN V-1, V-8
1. TREATMENT FACILITY BYPASS:
CLOSE V-1, V-4, V-6, V-8
OPEN V-5, V-7
2. SBR FACILITY BYPASS:
OPEN V-1, V-2, V-3, V-4
CLOSE V-5, V-6, V-7, V-8
3. EQUALIZATION TANK #1 BYPASS:
OPEN V-3, V-5, V-6, V-8
CLOSE V-1, V-2, V-4, V-7
4. EQUALIZATION TANK #2 BYPASS:
OPEN V-1, V-8
CLOSE: V-5, V-2, V-3, V-4, V-6, V-7

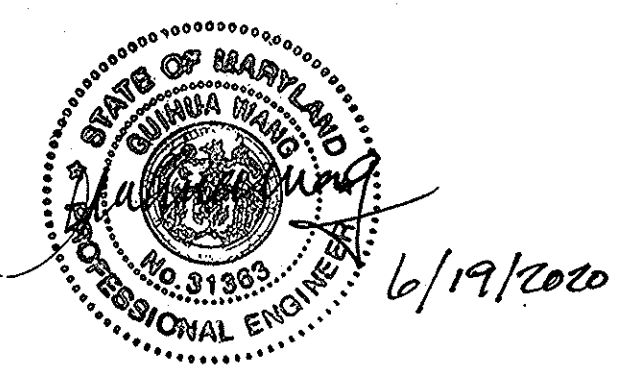
GRAPHIC SCALE



1 SITE PIPING PLAN
C-3 SCALE: 1"=5'

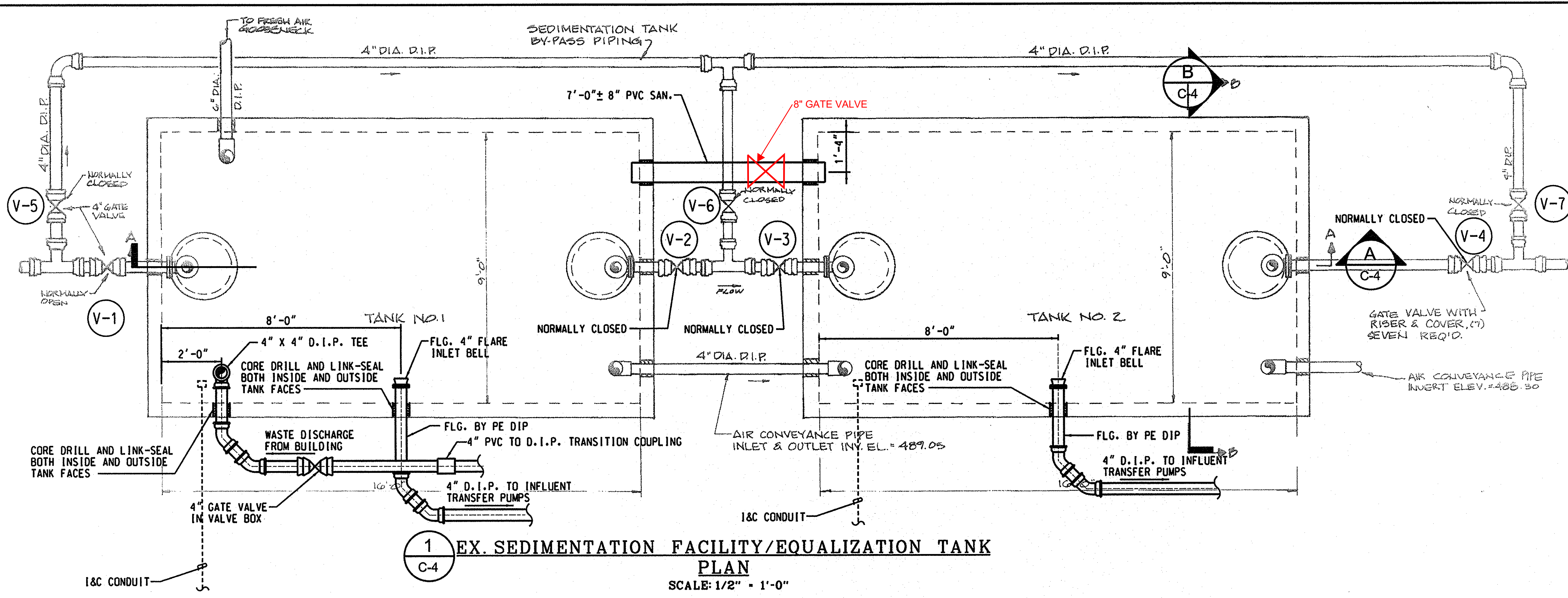
NOTE:
FOR PIPE PROFILES SEE DRAWINGS C-5 AND C-6.
THE CONTRACTOR SHALL COORDINATE WITH THE LOCATION OF THE EXISTING WATER PIPING IN THE RELOCATED SHEDS AND MAKE A CONNECTION WITH THE NEW LINE.

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 31363 EXPIRATION DATE: 01/16/2022



<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>James W. Butler</i> 2/17/21 DATE CHIEF, BUREAU OF UTILITIES</p> <p><i>James W. Butler</i> 2/17/21 DATE CHIEF, UTILITY DESIGN DIVISION</p>	<p>ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS</p> <p>KCI TECHNOLOGIES</p> <p>936 RIDGEBROOK ROAD SOWAS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 WWW.KCI.COM</p>	<p>DES: KFJ</p> <p>DRN: KFJ</p> <p>CHK: GW</p> <p>DATE: AUG. 2016</p>	<p>BY: KJ</p> <p>NO. AS-BUILT</p> <p>REVISION: ELECTRICAL DESIGN UPDATES 12/21</p> <p>ADDENDUM 1 6/20</p> <p>NOVEMBER 21, 2018 6/20</p>	<p style="text-align: center;">SITE PIPING PLAN</p> <p>600' SCALE MAP NO. 40-41 BLOCK NO. 12</p>	<p style="text-align: center;">ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY</p> <p style="text-align: center;">CAPITAL PROJECT NO. S-6269 CONTRACT NO. 50-4972</p> <p>ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND</p>	<p>C-3</p> <p>SCALE AS SHOWN</p> <p>SHEET</p> <p>5 OF 43</p>
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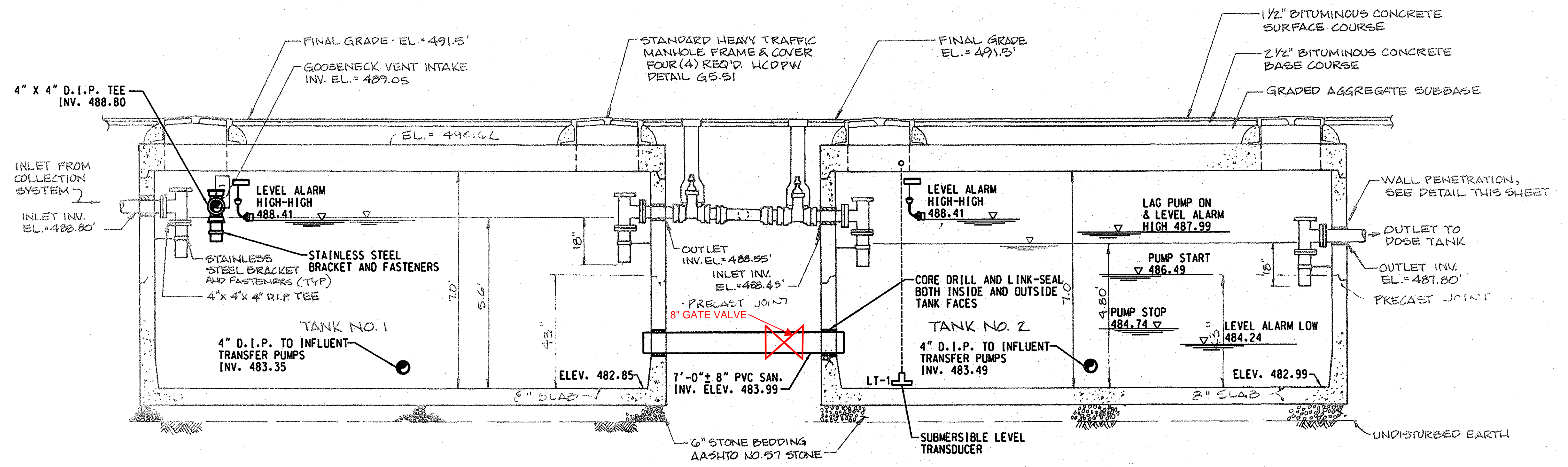
AS-BUILT REPLACEMENT SHEET 12/2021



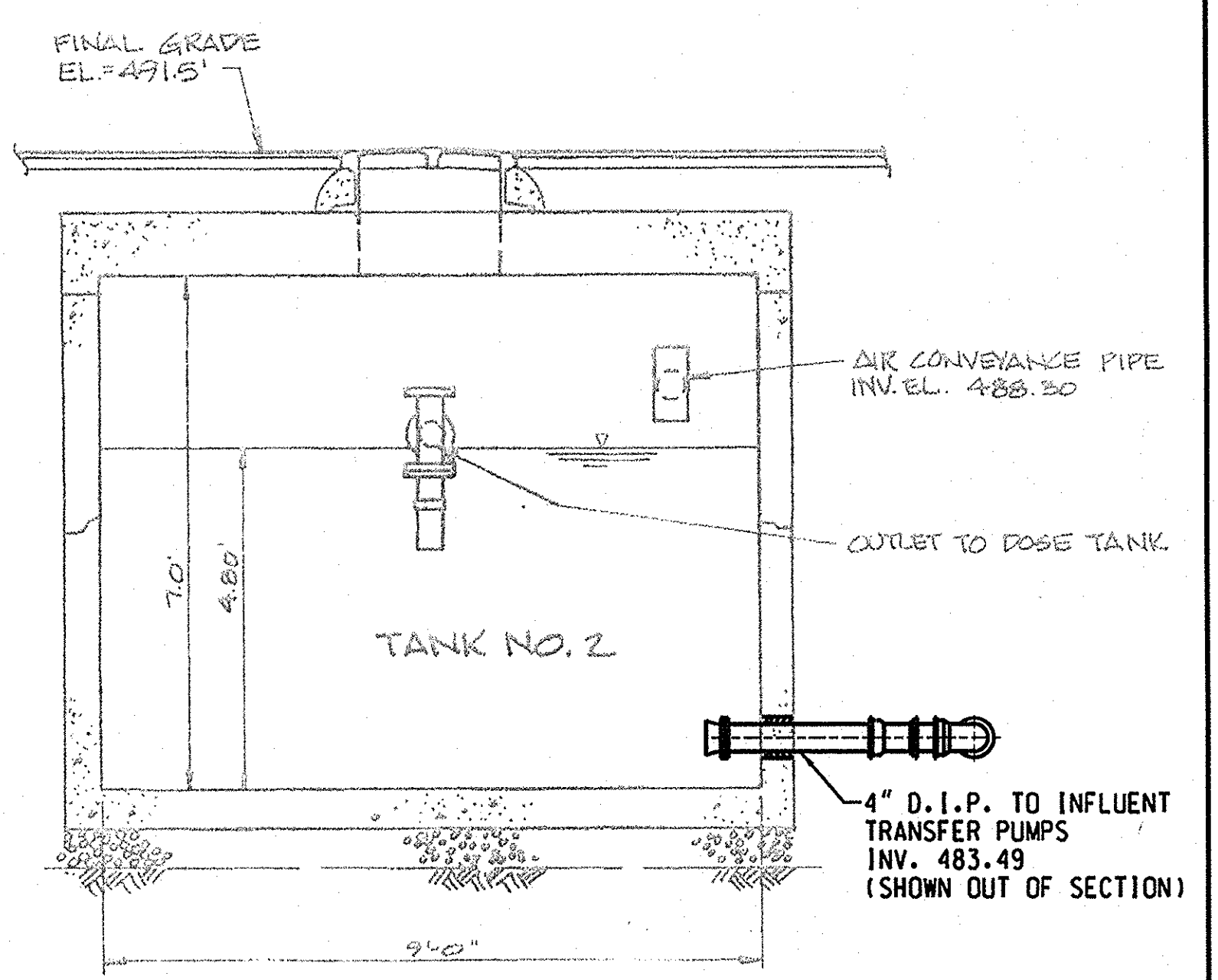
1 EX. SEDIMENTATION FACILITY/EQUALIZATION TANK PLAN
SCALE: 1/2" = 1'-0"

- SUGGESTED SEQUENCE OF CONSTRUCTION**
1. CLOSE V-3 AND V-4. OPEN V-6 AND V-7 ALLOWING SEWERAGE TO USE BYPASS PIPING.
 2. DEWATER EX. TANK NO.2 AND DISPOSE THE SEWAGE PROPERLY.
 3. INSTALL ASSOCIATED PIPING AND INFLUENT TRANSFER PUMPS. PLUG DISCHARGE PIPES UNTIL PREPARED TO ATTACH TO NEW SBR.
 4. PREPARE TANK NO.2 FOR INSTALLATION OF NEW 8" PVC PIPE IN ORDER TO CONVERT BOTH TANKS TO EQUALIZATION TANK.
 5. CLOSE V-1, V-6 AND OPEN V-5. ALLOW SEWERAGE TO USE BYPASS PIPING.
 6. DEWATER EX. TANK NO.1 AND DISPOSE THE SEWAGE PROPERLY.
 7. INSTALL 8" PVC PIPE IN ORDER TO CONVERT TANK NO. 1 AND TANK NO. 2 TO AN EQUALIZATION TANK.
 8. OPEN V-1, V-2, V-3 AND V-4. CLOSE V-5, V-6 AND V-7. ALLOW SYSTEM TO OPERATE AS NORMAL (PRIOR TO THE COMPLETION OF NEW SYSTEM).
 9. INSTALL SBR FACILITY AND ASSOCIATED PIPING, EQUIPMENT, AND ELECTRICAL CONDUIT.
 10. UNPLUG THE DISCHARGE PIPES OF INFLUENT TRANSFER PUMPS. CLOSE V-2, V-3, AND V-4. BRING SBR FACILITY ONLINE.

NOTES:
1. SEE HIGH PERFORMANCE COATING SPECIFICATION FOR THE COATING REQUIREMENT FOR THE EQUALIZATION TANKS.

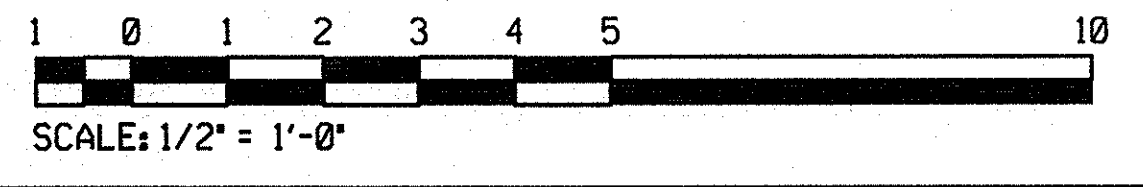
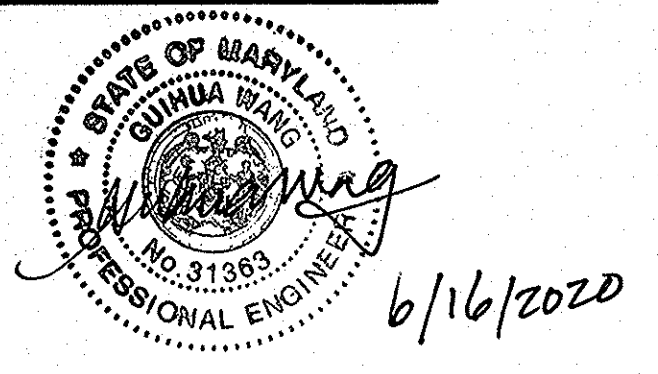


A EX. SEDIMENTATION FACILITY/EQUALIZATION TANK SECTION A-A
SCALE: 1/2" = 1'-0"



B EX. SEDIMENTATION FACILITY/EQUALIZATION TANK SECTION B-B
SCALE: 1/2" = 1'-0"

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AS-BUILT
DATE 12/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 2/6/17
Chief, Bureau of Utilities: *[Signature]* 11/25/10

Chief, Bureau of Engineering: *[Signature]* 2/6/17
Chief, Utility Design Division: *[Signature]* 2/13/17

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

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PROFESSIONAL ENGINEER
Guohua Wang
No. 31383
6/16/2020

DES: KFJ					
DRN: KFJ					
CHK: GW					
DATE: 12/21					
AUG. 2016	KJ	AS-BUILT			
BY NO.					
REVISION					

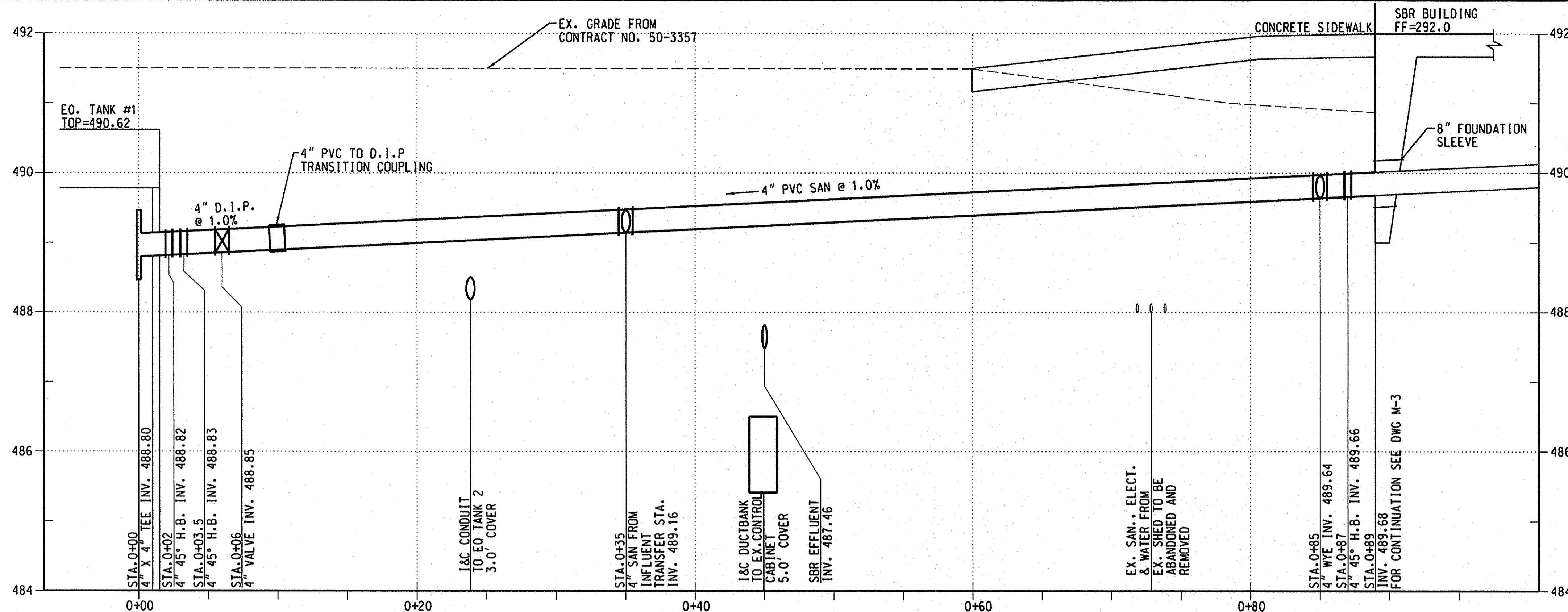
EQUALIZATION TANK

600' SCALE MAP NO. 40-41 BLOCK NO. 12

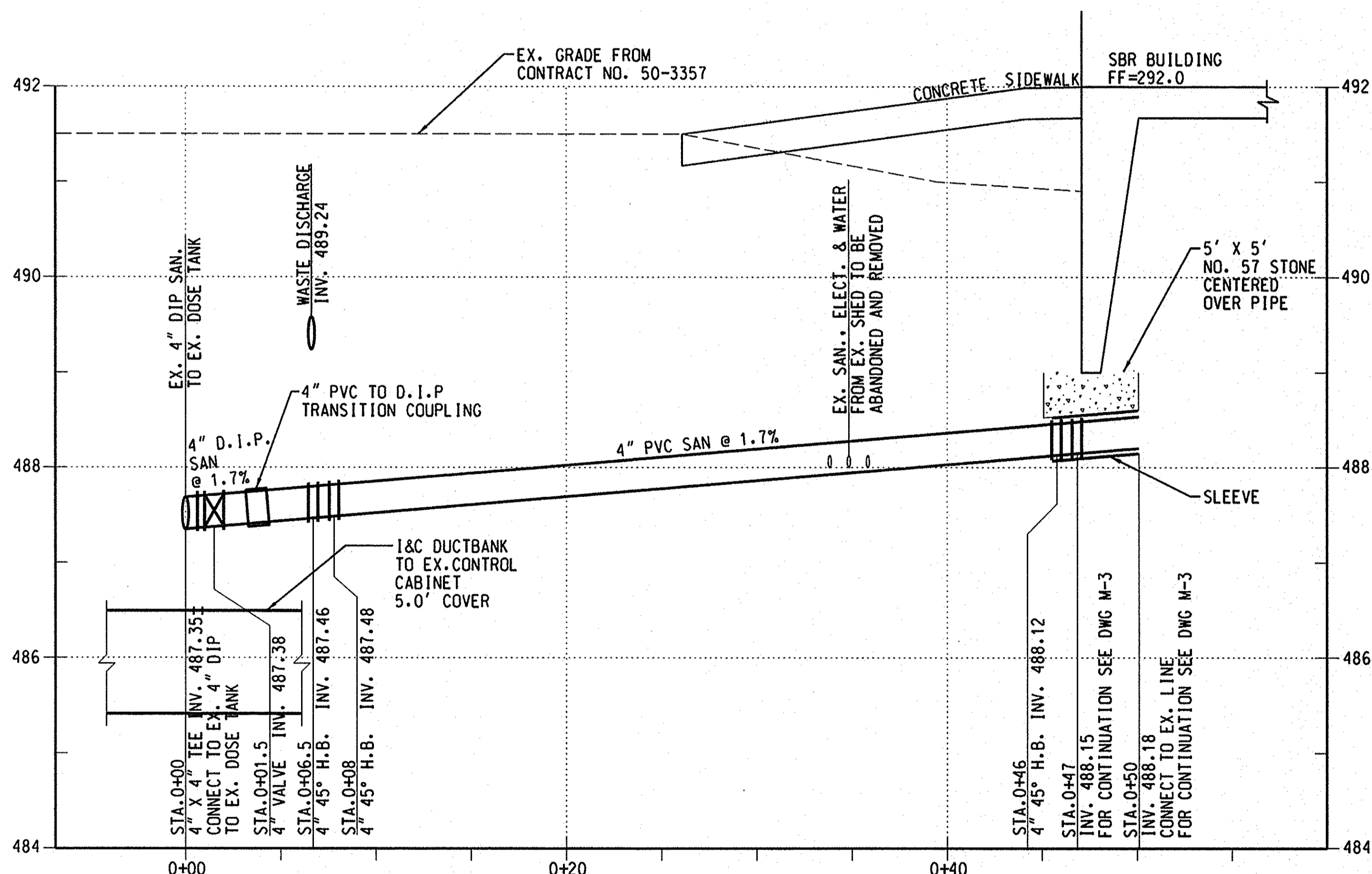
ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 6 OF 43

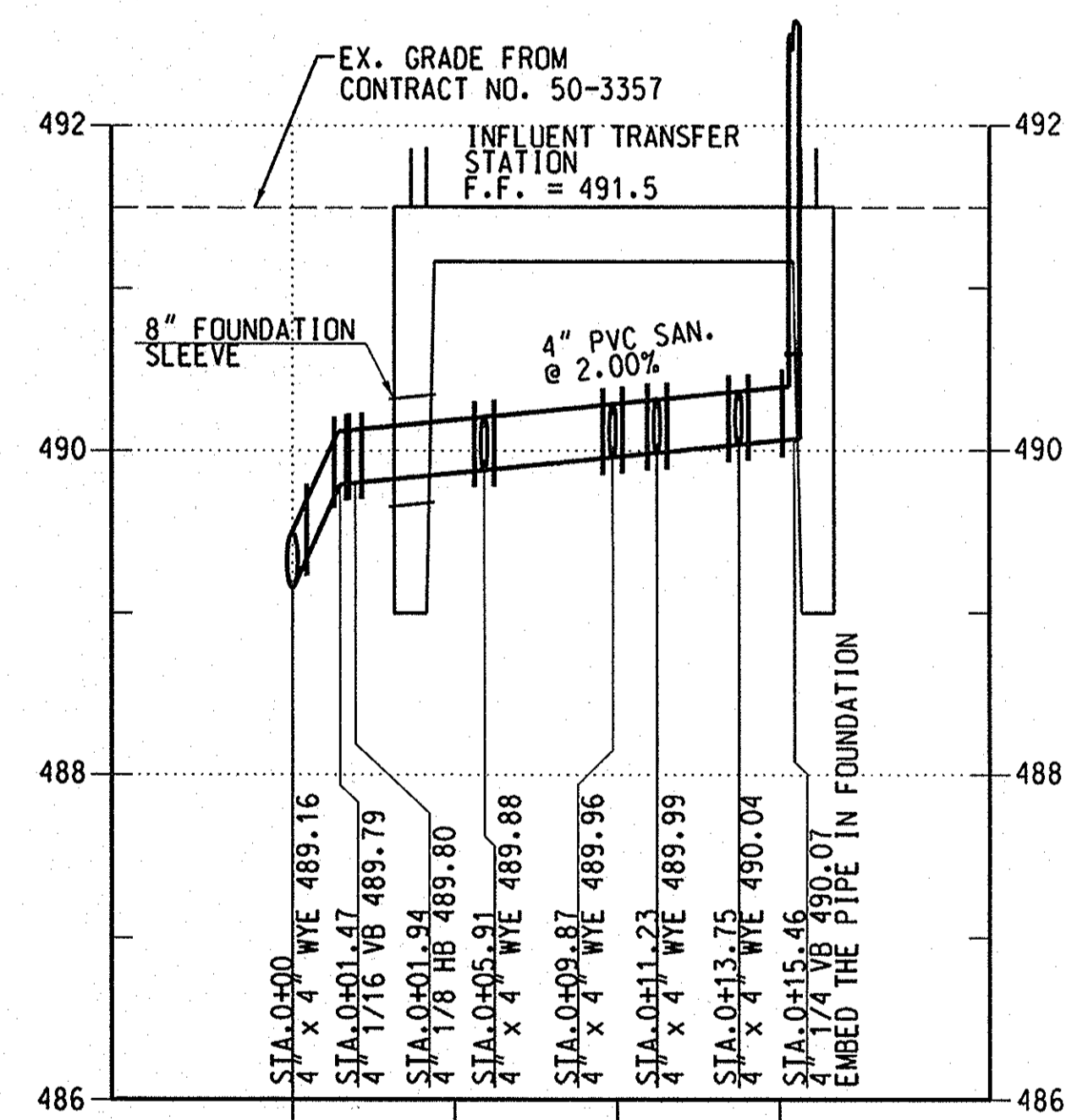


1 PROFILE - WASTE DISCHARGE
 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'



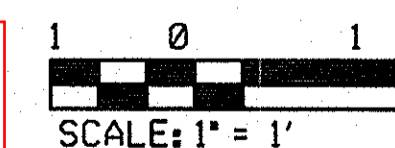
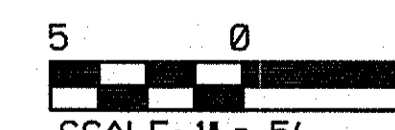
2 PROFILE - SBR EFFLUENT
 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'

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3 PROFILE - INFLUENT TRANSFER STATION
 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'

GRAPHIC SCALE



AS-BUILT
DATE 12/2021

PLOTTED: SDATES BY: BUSEYRANVES

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

James E. Knolls 2/17/21
 CHIEF, BUREAU OF UTILITIES DATE

James E. Knolls 2/17/21
 CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
 PLANNERS
 SCIENTISTS
 CONSTRUCTION MANAGERS

KCI TECHNOLOGIES

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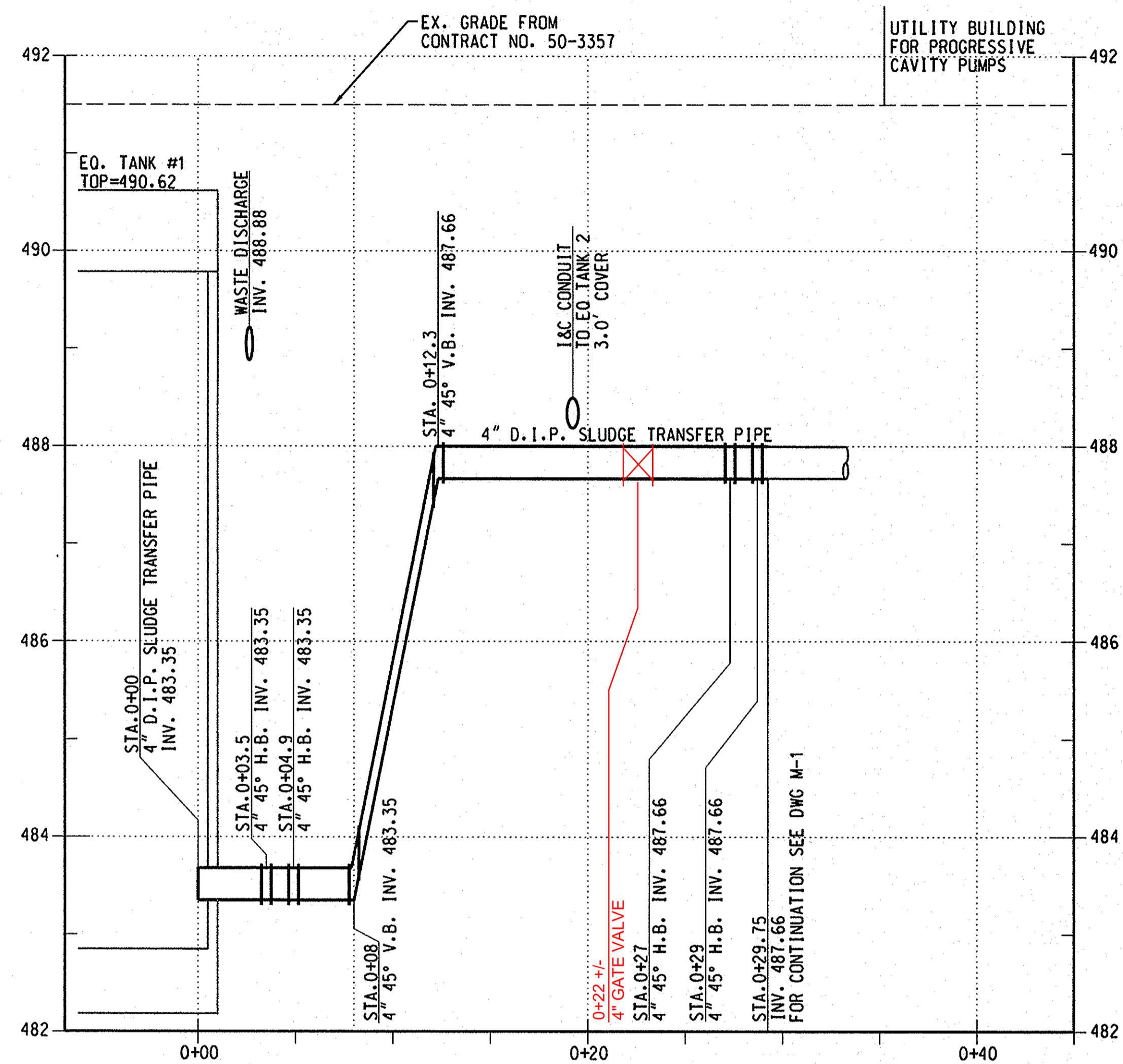
STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 10/10/2016

DES: KFJ					
DRN: KFJ					
CHK: GW					
DATE: AUG. 2016	BY: NO.	REVISION	DATE	600' SCALE MAP NO. 40-41	BLOCK NO. 12

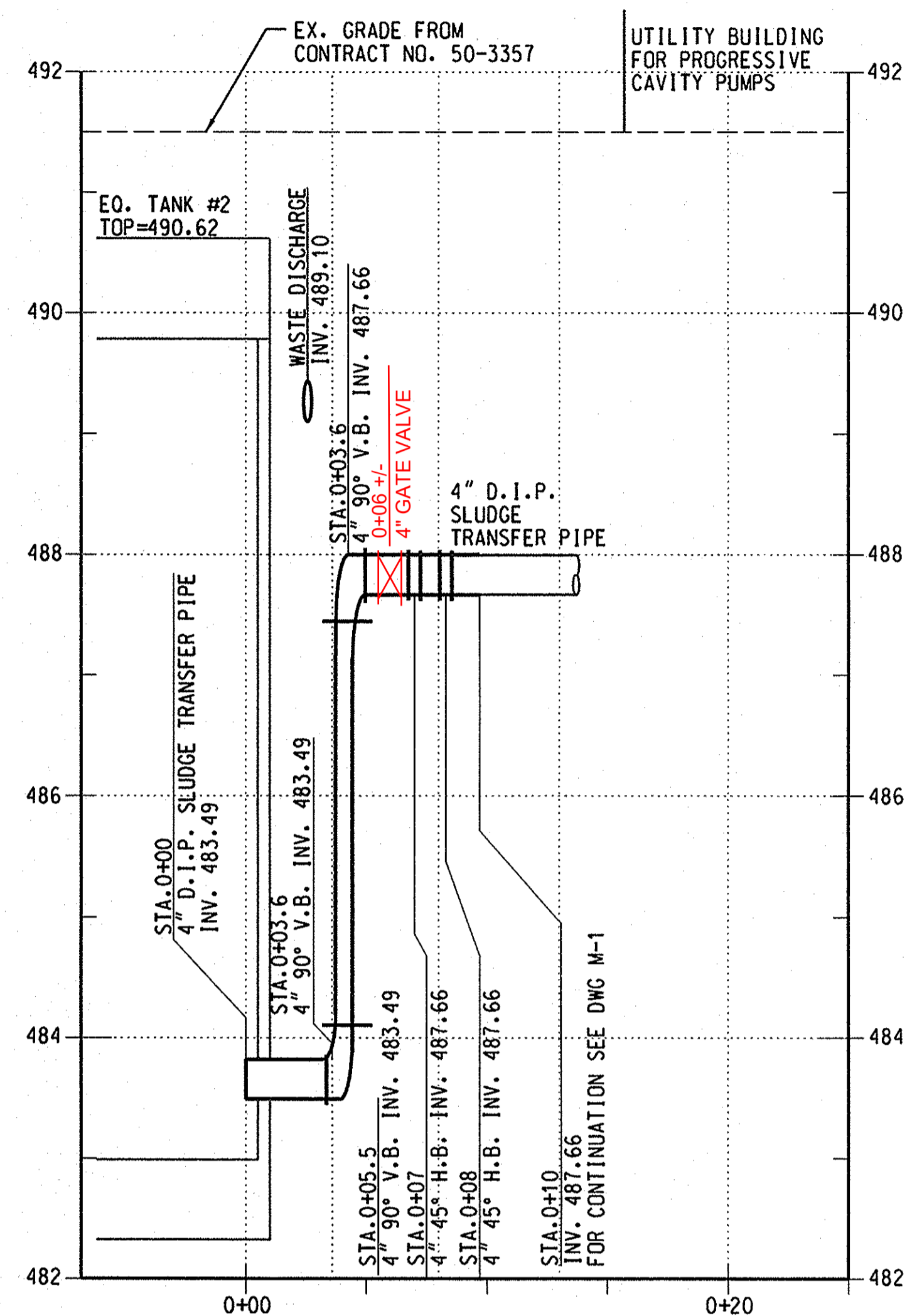
SITE PIPING PROFILES

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

C-5
 SCALE AS SHOWN
 SHEET 7 OF 43



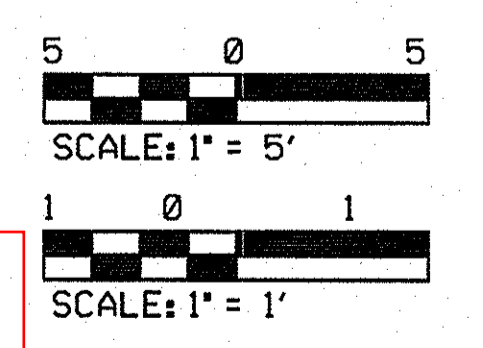
1 PROFILE - INFLUENT TRANSFER PIPE - EQ. TANK #1
 C-6 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'



2 PROFILE - INFLUENT TRANSFER PIPE - EQ. TANK #2
 C-6 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'

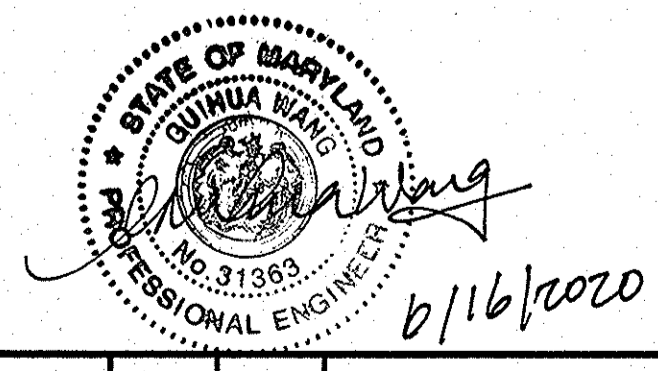
NOTE:
 ALL PIPE JOINTS AND
 PIPE FITTINGS MUST
 BE RESTRAINED JOINT
 TYPE

GRAPHIC SCALE

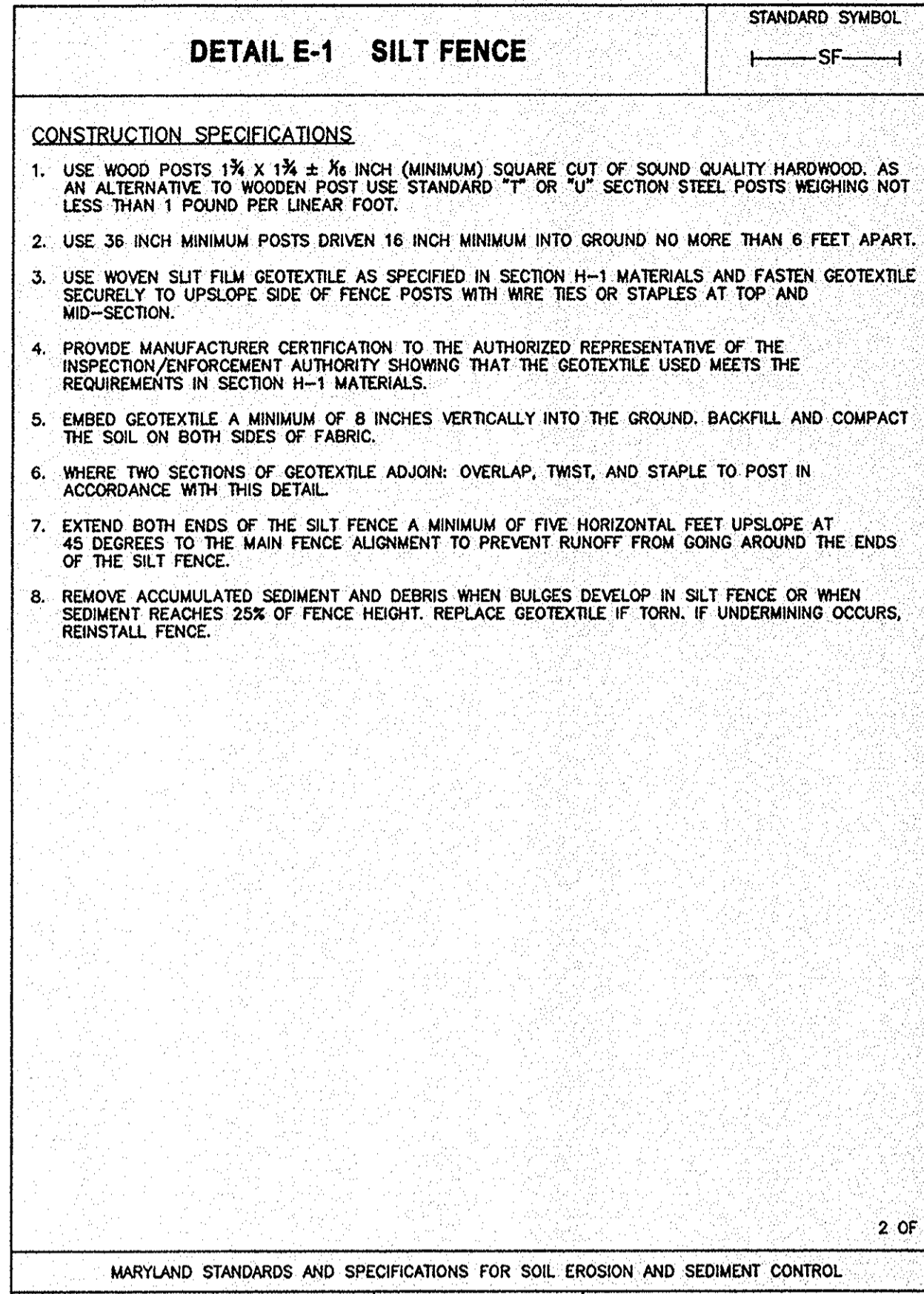
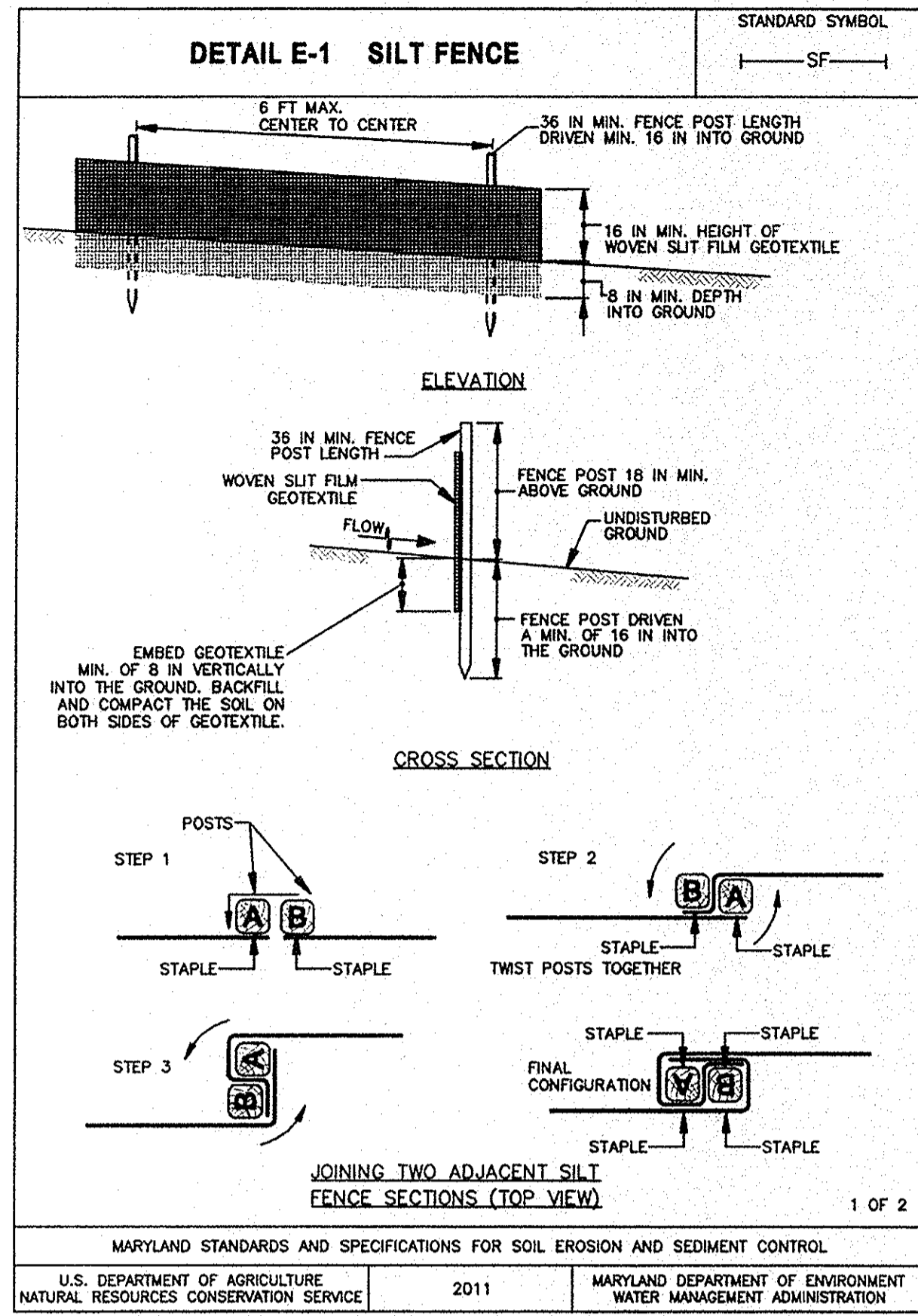


AS-BUILT
 DATE 12/2021

PROFESSIONAL CERTIFICATION, I HEREBY
 CERTIFY THAT THESE DOCUMENTS WERE
 PREPARED OR APPROVED BY ME, AND THAT
 I AM A DULY LICENSED PROFESSIONAL
 ENGINEER UNDER THE LAWS OF THE STATE
 OF MARYLAND, LICENSE NO. 31363
 EXPIRATION DATE: 01/16/2022



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director of Public Works: <i>[Signature]</i> 2/1/17 Chief, Bureau of Utilities: <i>[Signature]</i> 11/2/17	James E. Butler 2/1/17 Chief, Bureau of Engineering Chief, Utility Design Division	KCI TECHNOLOGIES 936 RIDGEBROOK ROAD SUITE 200, MARYLAND 21132 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 WWW.KCI.COM	DES: KFJ						SITE PIPING PROFILES	ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972	SCALE AS SHOWN
			DRN: KFJ								
			CHK: GW							ELECTION DISTRICT NO. 5	HOWARD COUNTY, MARYLAND
			DATE: AUG. 2016	KJ	AS-BUILT	11/21			600' SCALE MAP NO. 40-41	BLOCK NO. 12	8 OF 43



HOWARD SOIL CONSERVATION DISTRICT (HSCD) STANDARD SEDIMENT CONTROL NOTES

- A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-313-1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hour notice to CID must be given at the following stages:
 - Prior to the start of earth disturbance.
 - Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading.
 - Prior to the start of another phase of construction or opening of another grading unit.
 - Prior to the removal or modification of sediment control practices.
- Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made. Other related state and federal permits shall be referenced, to ensure coordination and to avoid conflicts with this plan.
- All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.
- All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL (for topsoil) (Sec. B-4-2), permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) specifications shall be enforced in areas with >15% of cut and/or fill. Stockpiles (Sec. B-4-5) in excess of 20 ft. must be benched with stable outlet. All concentrated flow, steep slopes, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).
- All sediment control structures are to remain in place, and are to be maintained in operative condition until permission for their removal has been obtained from the CID.
- Site Analysis:

Total Area of Site:	0.48	Acres
Area to be seeded or paved:	0.24	Acres
Area to be vegetatively stabilized:	0.13	Acres
Total Cut:	161.50	Cu. Yds.
Total Fill:	119.90	Cu. Yds.

 Off-site wash/borrow area location: **CONTRACTOR TO COORDINATE**
- Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the CID. The site and all reports shall be inspected by the contractor weekly, and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:
 - Inspection date
 - Inspection type (routine, pre-storm event, during rain event)
 - Name and title of inspector
 - Weather information (current conditions as well as time and amount of last recorded precipitation)
 - Brief description of project's status (e.g., percent complete) and/or current activities
 - Evidence of sediment discharges
 - Identification of plan deficiencies
 - Identification of sediment controls that require maintenance
 - Identification of missing or improperly installed sediment controls
 - Compliance status regarding the sequence of construction and stabilization requirements
 - Photographs
 - Monitoring/sampling
 - Maintenance and/or corrective action performed
 - Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).
- Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back-filled and stabilized by the end of each workday, whichever is shorter.
- Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may be allowed by the CID per the list of HSCD-approved field changes.
- Disturbance shall not occur outside the L.O.D. A project is to be sequenced so that grading activities begin on one grading unit (maximum average of 20 sq. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has been stabilized and approved by the HSCD. Unless otherwise specified and approved by the HSCD, no more than 30 acres cumulatively may be disturbed at a given time.
- Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.
- Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.
- All Silt Fence and Super Silt Fence shall be placed on the contour, and be imbricated at 25' minimum intervals, with lower sides curled uphill by 2' in elevation.
- Stream channels must not be disturbed during the following restricted time periods (inclusive):
 - Use I and II March 1 - June 15
 - Use III and IIII October 1 - April 30
 - Use IV March 1 - May 31
- A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

SEDIMENT AND EROSION CONTROL SEQUENCE OF CONSTRUCTION

- OBTAIN GRADING PERMIT.
- DELINEATE THE LIMIT OF DISTURBANCE (LOD), REQUEST PRE-CONSTRUCTION MEETING ON-SITE WITH REPRESENTATIVES OF HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION.
- LAYOUT THE SITE (2 DAYS).
- CLEAR AND GRUB AS NEEDED FOR THE INSTALLATION OF THE SEDIMENT CONTROL DEVICES AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR. INSTALL AND STABILIZE THE SEDIMENT CONTROL DEVICES IF NECESSARY. (2 DAYS)
- EXCAVATE SITE FOR THE MODIFICATION OF EXISTING SEDIMENTATION TANKS TO EQUALIZATION TANKS, CONSTRUCTION OF INFLUENT TRANSFER PUMPING, ELECTRICAL CONDUIT, GENERATOR, AND SBR FACILITY (7 MONTHS).
- PERFORM FINAL GRADING, PERMANENTLY STABILIZE ALL DISTURBED VEGETATED AREAS IN ACCORDANCE WITH SECTION B-4-5 OF THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL". (5 DAYS).
- CLEAN UP CONSTRUCTION SITE, DEMOBILIZE (1 DAY)
- REMOVE SEDIMENT CONTROL DEVICES AFTER PERMISSION IS GRANTED BY THE SEDIMENT CONTROL INSPECTOR.
- STABILIZE ALL AREAS THAT ARE DISTURBED BY REMOVAL OF SEDIMENT CONTROL DEVICES.

TEMPORARY SEEDING SUMMARY

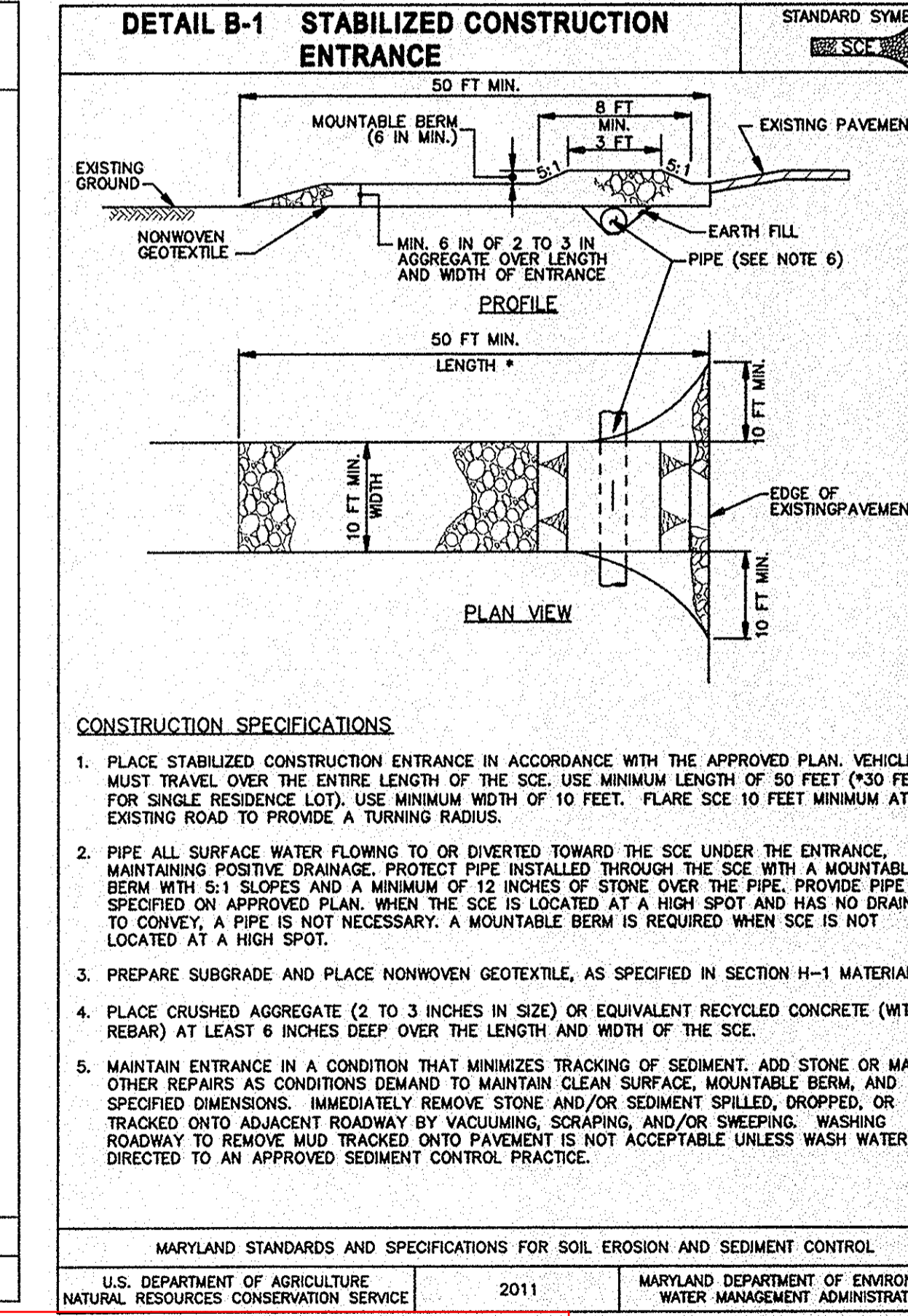
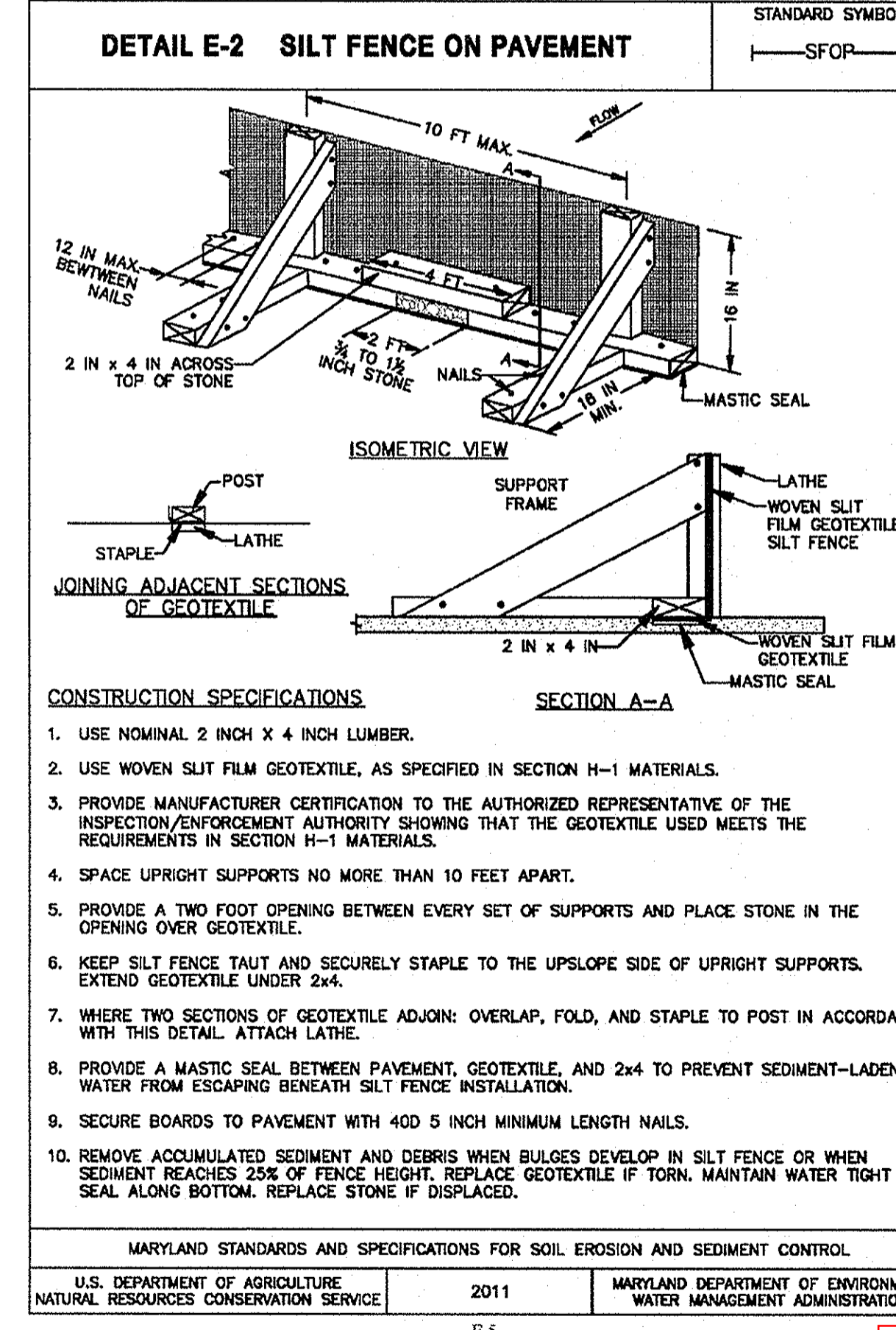
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	FERTILIZER	
					RATE (10-20-20)	LIME RATE
	COOL-SEASON GRASS					
	ANNUAL RYE GRASS (LOLIUM PERENNIS)	40	MAR 15 TO MAY 31 AUG 1 TO OCT 15	0.5		
	BARLEY (HORDEUM)	96	MAR 15 TO MAY 31 AUG 1 TO OCT 15	1.0		
	DAISY (LAVENA SATIVA)	72	MAR 15 TO MAY 31 AUG 1 TO OCT 15	1.0	436 LB/AC	2 TONS/AC
	WHEAT (TRITICUM AESTIVUM)	120	MAR 15 TO MAY 31 AUG 1 TO OCT 15	1.0	(10LB/1000 SF)	(90LB/1000 SF)
	CERIAL RYE (SECTARIA ITALICA)	112	MAR 15 TO MAY 31 AUG 1 TO NOV 15	1.0		
	WARM-SEASON GRASS					
	FOXTAIL MILLET (SETARIA ITALICA)	30	MAY 16 TO JUL 31	0.5		
	PEARL MILLET (Pennisetum glaucum)	20	MAY 16 TO JUL 31	0.5		

NOTES:

- Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.
- Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For small-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 9% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.
- Oats are the recommended nurse crop for warm-season grasses.
- For sandy soils, plant seeds at twice the depth listed above.
- The planting dates listed are averages for each zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

Permanent Seeding Summary

No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)			Lime Rate
					N	P ₂ O ₅	K ₂ O	
	Hardiness Zone (from Figure B.3): 9							
	Seed Mixture (from Table B.3): 9							
	TALL FESCUE	60	MAR 1 TO MAY 15 AUG 1 TO OCT 15	1/4-1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	KENTUCKY BLUEGRASS	40	MAR 1 TO MAY 15 AUG 1 TO OCT 15	1/4-1/2 in				
	SWITCH GRASS	10	MAY 16 TO JUL 31	1/4-1/2 in				



AS-BUILT DATE 12/2021

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 31363 EXPIRATION DATE: 01/16/2022

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE 2/6/17

CHIEF, BUREAU OF UTILITIES DATE 11/25/17

CHIEF, UTILITY DESIGN DIVISION DATE 2/18/17

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS

KCI TECHNOLOGIES

936 RIDGEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE: (410) 316-7800
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WWW.KCI.COM

STATE OF MARYLAND PROFESSIONAL ENGINEER

10/10/2016

DES: KFJ
DRN: KFJ
CHK: GW
DATE: AUG. 2016

BY NO. REVISION

DATE 600' SCALE MAP NO. 40-41 BLOCK NO. 12

SEDIMENT AND EROSION CONTROL NOTES AND DETAILS

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6289
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 9 OF 43

OWNER'S ADDRESS

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF UTILITIES
8250 OLD MONTGOMERY ROAD
COLUMBIA MARYLAND, 21045

STATE OF MARYLAND PROFESSIONAL ENGINEER

6/16/2020

LOUVER ID	MECHANICAL ID	WIDTH	HEIGHT	APP
LV1	EF-1	36"	36"	8'-2"
LV1	EF-2	36"	36"	8'-4"
LV2	EF-3 (BDD)	24"	24"	9'-0"
LV3	EF-4 (SHUTTER VENT)	6"	6"	9'-0"
LV2	EF-5	24"	24"	7'-0"
---	HVAC-1	---	---	---
LV5	MOD-1	48"	60"	3'-6"
LV5	MOD-2	48"	60"	3'-6"
LV2	MOD-3 (SF-1)	24"	24"	8'-2"
LV2	MOD-4	24"	24"	9'-0"
LV2	MOD-5	24"	24"	7'-0"
LV2	EXHAUST LOUVER (MECH. RM.)	24"	24"	8'-0"

DOOR ID	FRAME MATERIAL	DOOR MATERIAL	DOOR WIDTH	DOOR HEIGHT	FIRE RATING	REMARKS
D1	HOLLOW METAL	HOLLOW METAL	3'-0"	7'-0"	N/A	WEATHER PROOF THRESHOLD, PANIC EXIT BAR, DOOR WINDOW
D2	HOLLOW METAL	HOLLOW METAL	6'-0"	7'-0"	N/A	WEATHER PROOF THRESHOLD, PANIC EXIT BAR, DOOR WINDOW
D3	HOLLOW METAL	HOLLOW METAL	6'-0"	7'-0"	N/A	BASIC DOOR, PANIC EXIT BAR, DOOR WINDOW
D4	HOLLOW METAL	HOLLOW METAL	3'-0"	7'-0"	N/A	BASIC DOOR, PANIC EXIT BAR, DOOR WINDOW
D5	HOLLOW METAL	HOLLOW METAL	3'-0"	7'-0"	N/A	BASIC DOOR WITH INLET GRILL - LOCK

NOTES
 1. WEATHER SEALS ARE NOT REQUIRED ON INTERIOR DOORS.
 2. NO WINDOWS ON TOILET ROOM DOOR.
 3. PANIC EXIT BAR IS NOT REQUIRED ON INTERIOR DOORS.

WALL ID	INSULATION RATING	INTERIOR CLADDING	INTERIOR FINISH
W1	R-20	GYP SUM BOARD	SYSTEM NO. 10
W2	R-13	GYP SUM BOARD	SYSTEM NO. 10
W3	R-20	GYP SUM BOARD	FRP PANELING ADHERED TO GYP SUM
W4	R-13	GYP SUM BOARD	FRP PANELING ADHERED TO GYP SUM

ABBREVIATIONS

AFS ABOVE FINISH FLOOR
 OHD OVERHEAD DOOR
 SD SMOKE DETECTOR
 FE FIRE EXTINGUISHER

FIRE EXTINGUISHER REQUIREMENTS

LOCATION: IN A CONSPICUOUS LOCATION WHERE THEY WILL HAVE READY ACCESS AND BE IMMEDIATELY AVAILABLE FOR USE. 906.5
 VIEW: PORTABLE FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED FROM VIEW. 906.6
 SIGNAGE: SIGNS OR OTHER MEANS USED TO INDICATE FIRE EXTINGUISHER LOCATION SHALL BE VISIBLE FROM NORMAL PATHS OF TRAVEL. 6.1.3.4.1
 RANGERS/BRAKETS: SHALL NOT BE FABRICATED IN THE FIELD. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. 6.1.3.4.1
 INSTALLATION: FIRE EXTINGUISHERS LESS THAN 40 LBS SHALL BE INSTALLED SO THE TOP IS NOT MORE THAN 5 FT. FROM THE FLOOR. FIRE EXTINGUISHERS MORE THAN 40 LBS SHALL BE INSTALLED SO THE TOP IS NOT MORE THAN 3-1/2 FT. FROM THE FLOOR. IN NO CASE SHOULD ANY FIRE EXTINGUISHER BE LESS THAN 4 INCHES FROM THE FLOOR. 6.1.3.8.11 6.1.3.8.21 6.1.3.8.3
 TRAVEL DISTANCE: FIRE EXTINGUISHERS SHALL BE LOCATED SO THAT THE MAXIMUM TRAVEL DISTANCES SHALL NOT EXCEED 75 FT. 6.2.1.2.2
 TYPE: FIRE EXTINGUISHER SHALL BE MULTIPURPOSE ABC 30 LB.

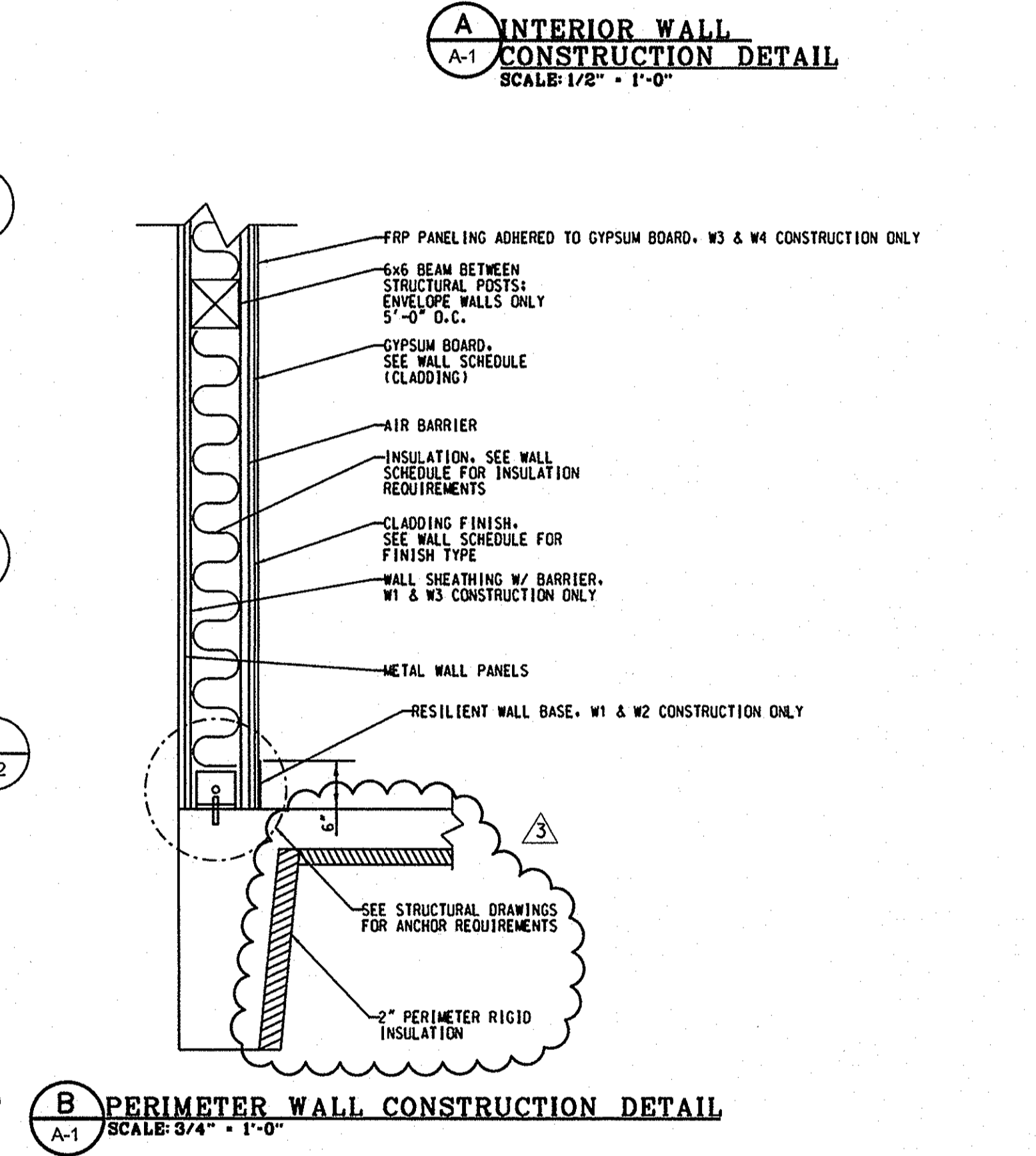
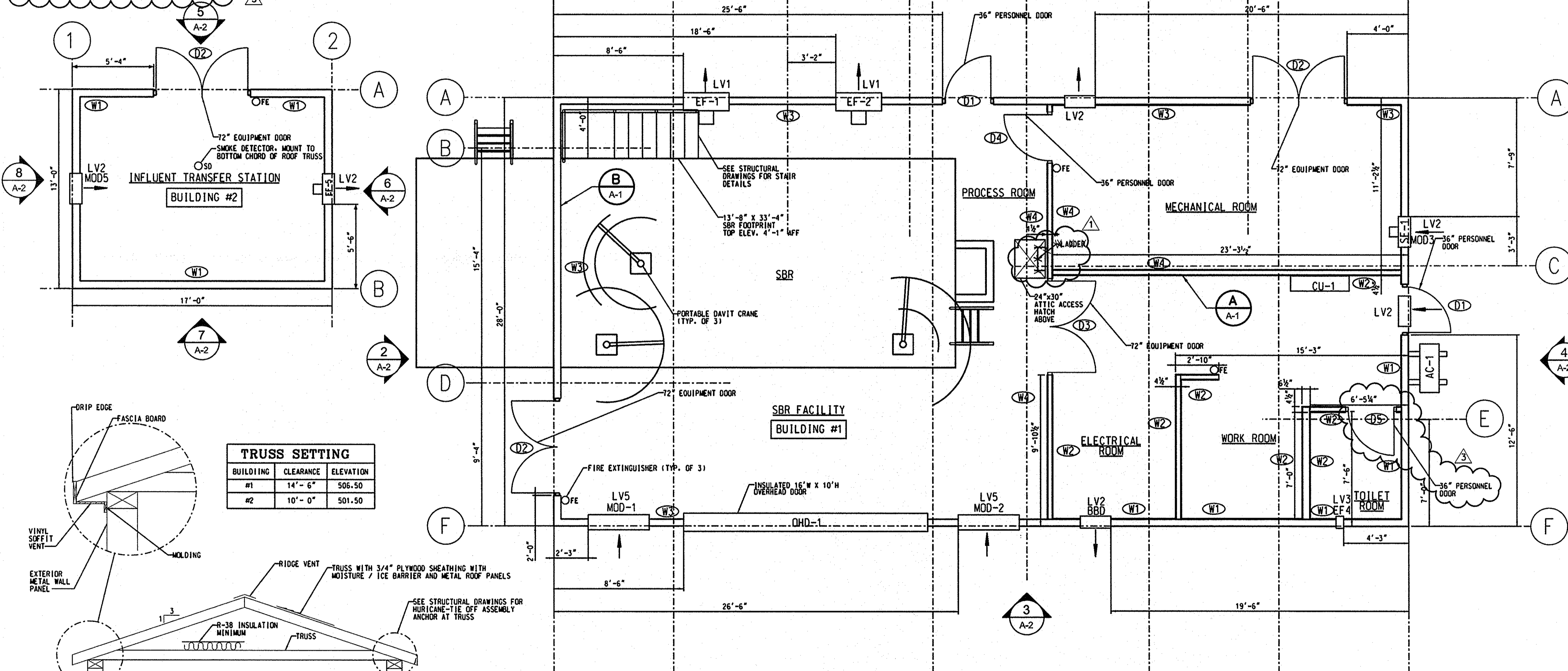
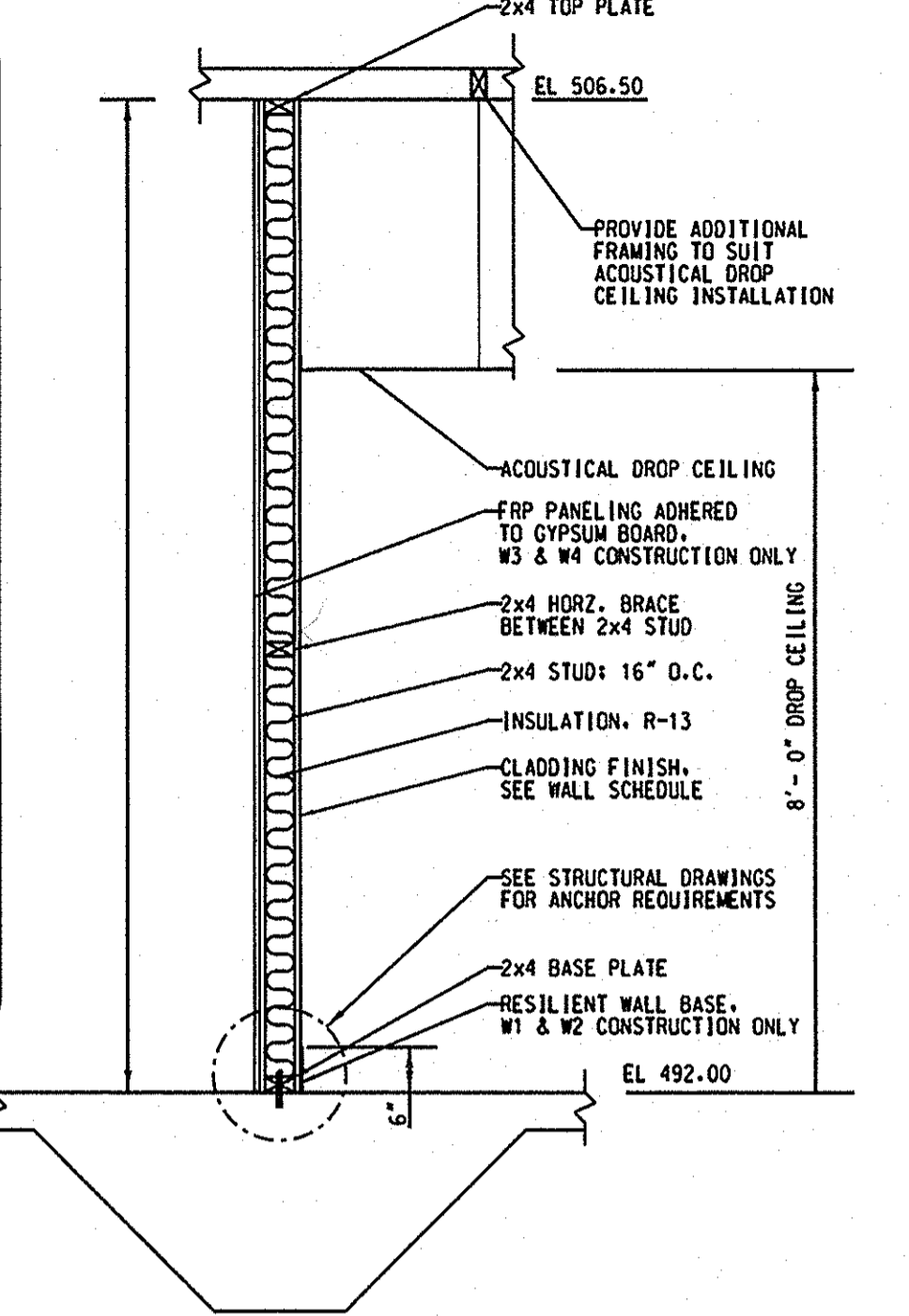
NOTES
 1. SUMMARY OF 2018 IBC SEC 906 AND NFPA 10.
 2. VERIFY QUANTITY AND LOCATIONS WITH CODE OFFICIAL.
 3. CONTRACTOR SHALL VERIFY REQUIREMENTS OF ALL ELEMENTS.

PROJECT INFORMATION

PROJECT NAME/ADDRESS: ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
 HOWARD COUNTY, MARYLAND

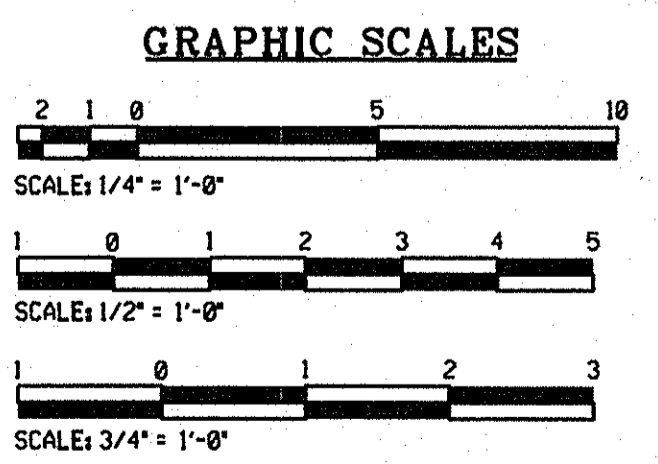
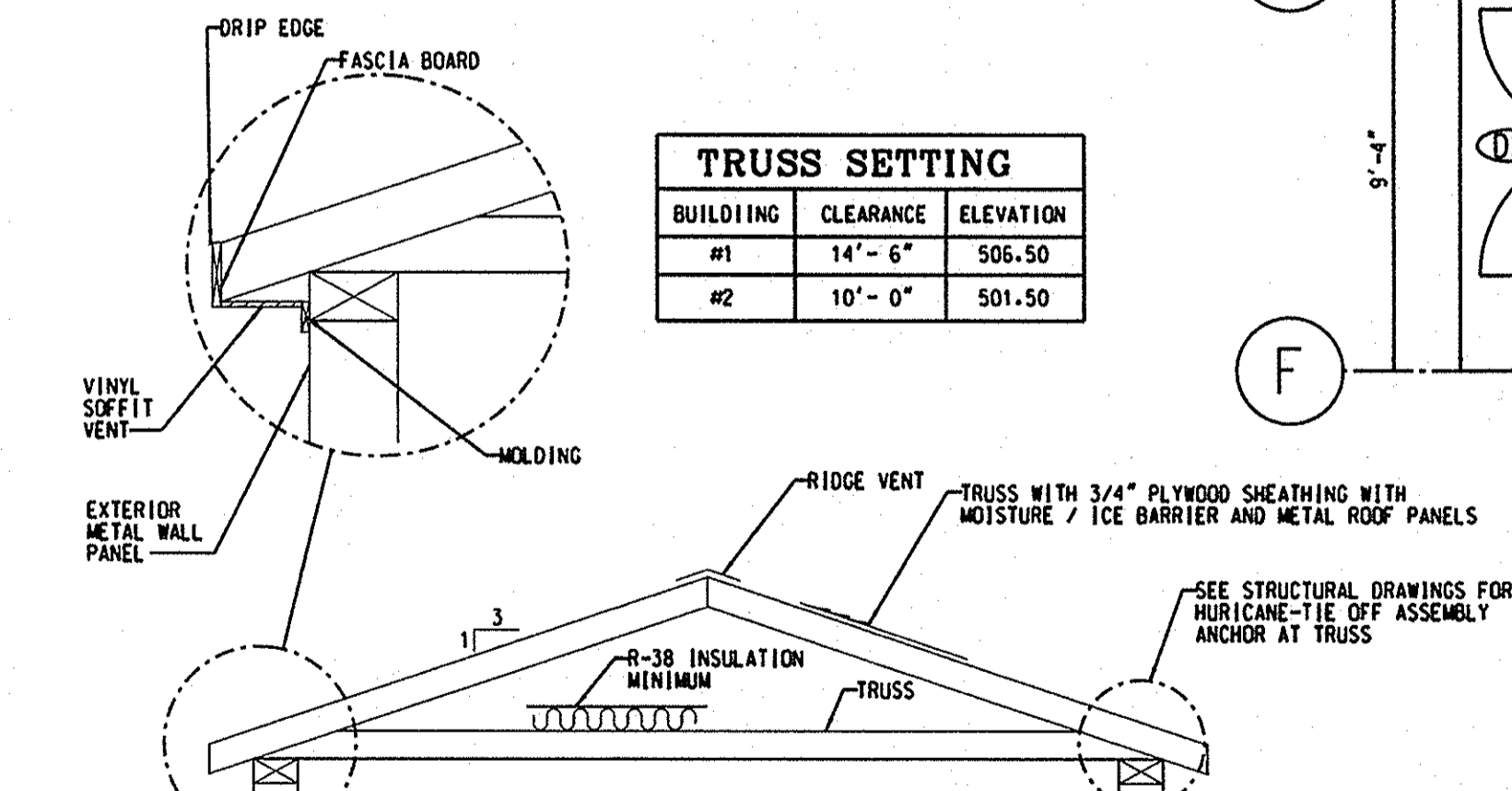
APPLICABLE CODES:
 INTERNATIONAL BUILDING CODE 2018
 NFPA 101 LIFE SAFETY CODE 2018
 INTERNATIONAL MECHANICAL CODE 2018
 NEC - NATIONAL ELECTRIC CODE WITH LOCAL AMENDMENTS (NFPA 70) 2017

- USE AND OCCUPANCY: FACTORY, GROUP F-2
- TYPE OF CONSTRUCTION: IV
- ALLOWABLE BUILDING HEIGHTS AND AREA (TABLE 504.4 & 508.2)
 AREA = 21,000 SF
 HEIGHT = 5 STORY
 ACTUAL HEIGHT: BUILDING 1: 20'-8"
 BUILDING 2: 13'-2"
 ACTUAL FLOOR AREA:
 TOTAL BUILDING FOOTPRINT = BUILDING 1: 1,568 S.F.
 BUILDING 2: 221 S.F.
- FIRE RESISTANCE RATING FOR BUILDING ELEMENTS
 STRUCTURAL FRAME: 0 HOUR
 BEARING WALLS: 0 HOUR
 NON-BEARING WALL (INT): 0 HOUR
 FLOOR CONSTRUCTION: 0 HOUR
 ROOF CONSTRUCTION: 0 HOUR
 FIRE SEPARATION DISTANCE: 0 HOUR (TABLE 602) (EXEMPT BECAUSE BUILDINGS ARE ON SAME PROPERTY)
 FIRE PROTECTION SYSTEM: NOT-SPRINKLERED
- ACTUAL OCCUPANT LOAD (NFPA 101, SECTION 7.3.1.2)
 N/A
- EGRESS WIDTH PER OCCUPANT SERVED
 DOORS (SECTION 1008.1.1) = 32 INCHES
- MINIMUM NUMBER OF EXITS REQUIRED (NFPA 101, SECTION 7.4.1.2)
 TWO (2) ON FIRST FLOOR
- MAXIMUM ACCESS TRAVEL DISTANCE: (NFPA 101, SECTION 39.2.6.2)
 ALLOWABLE: 200'-0" (NO SPRINKLER SYSTEM)
 ACTUAL: 30'-0" MAXIMUM
- CHEMICAL STORAGE TYPE & MAXIMUM VOLUME (IBC 2015, TABLE 307.1)
 OXIDIZER CLASS II: MAXIMUM LIQUID GALLONS (POUNDS): (250)
 (USE CLOSED SYSTEM)
 ACTUAL: 25 GALLONS (243 lbs.)
 CORROSIVES: MAXIMUM LIQUID GALLONS (POUNDS): (500)
 (USE CLOSED SYSTEM)
 ACTUAL: 50 GALLONS (400 lbs.)



TRUSS SETTING

BUILDING	CLEARANCE	ELEVATION
#1	14'-6"	506.50
#2	10'-0"	501.50



1 FLOOR PLAN
 SCALE: 1/4" = 1'-0"

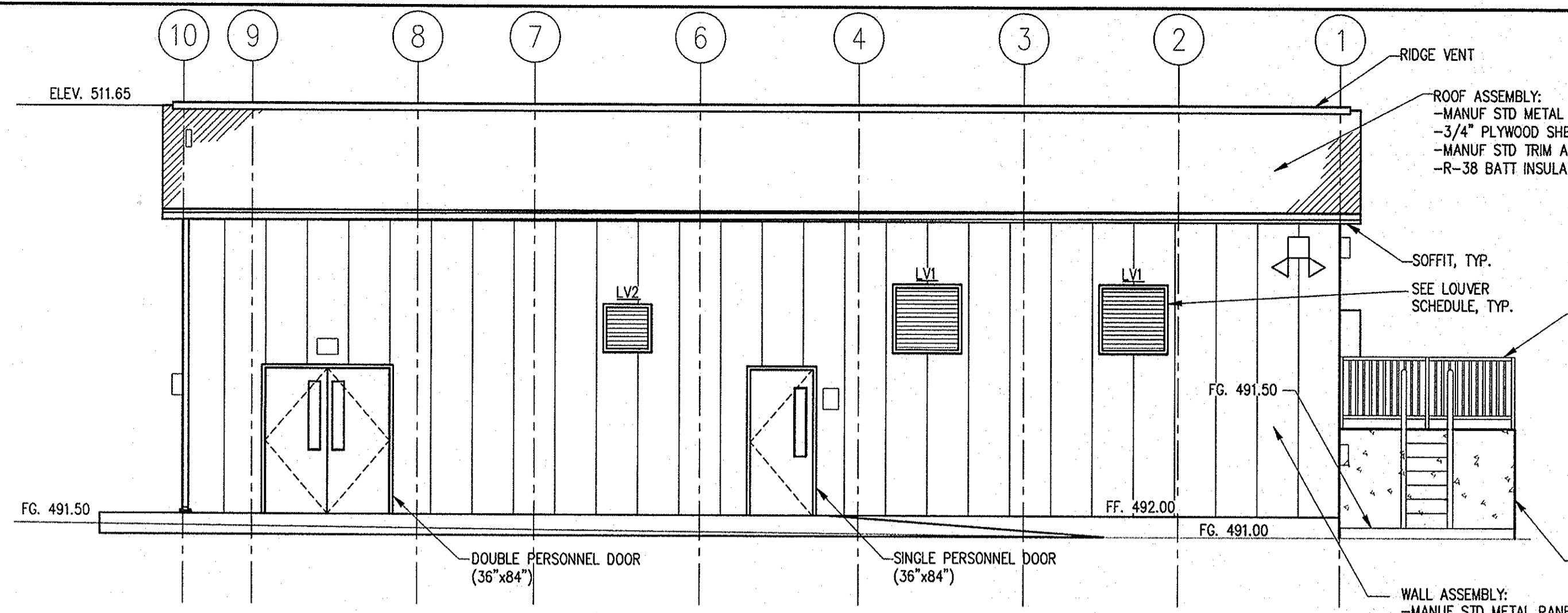
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6/16/20

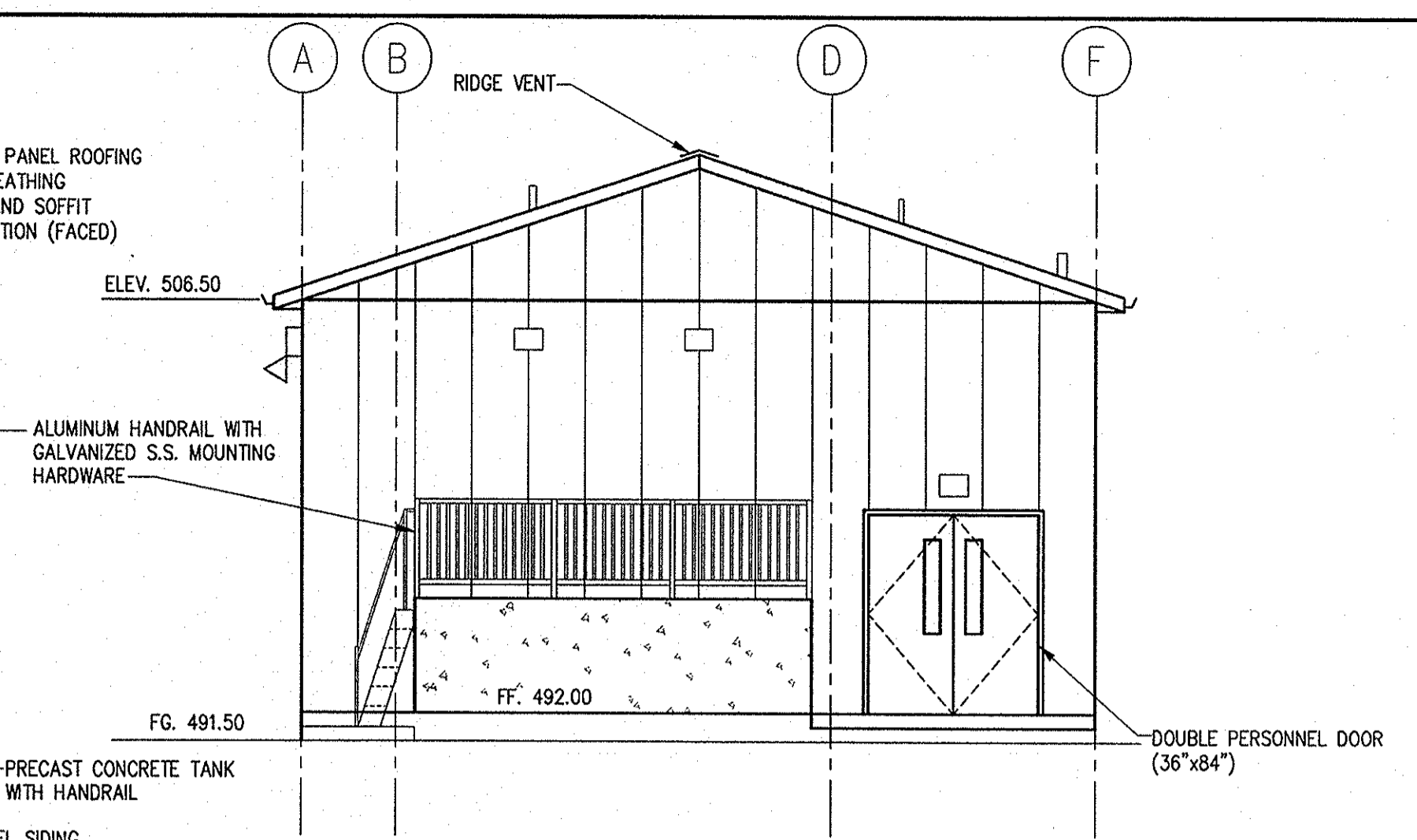
AS-BUILT
DATE 12/2021

Refer to Rasche Brothers building drawings (Submittal 13121-001r2) for building details

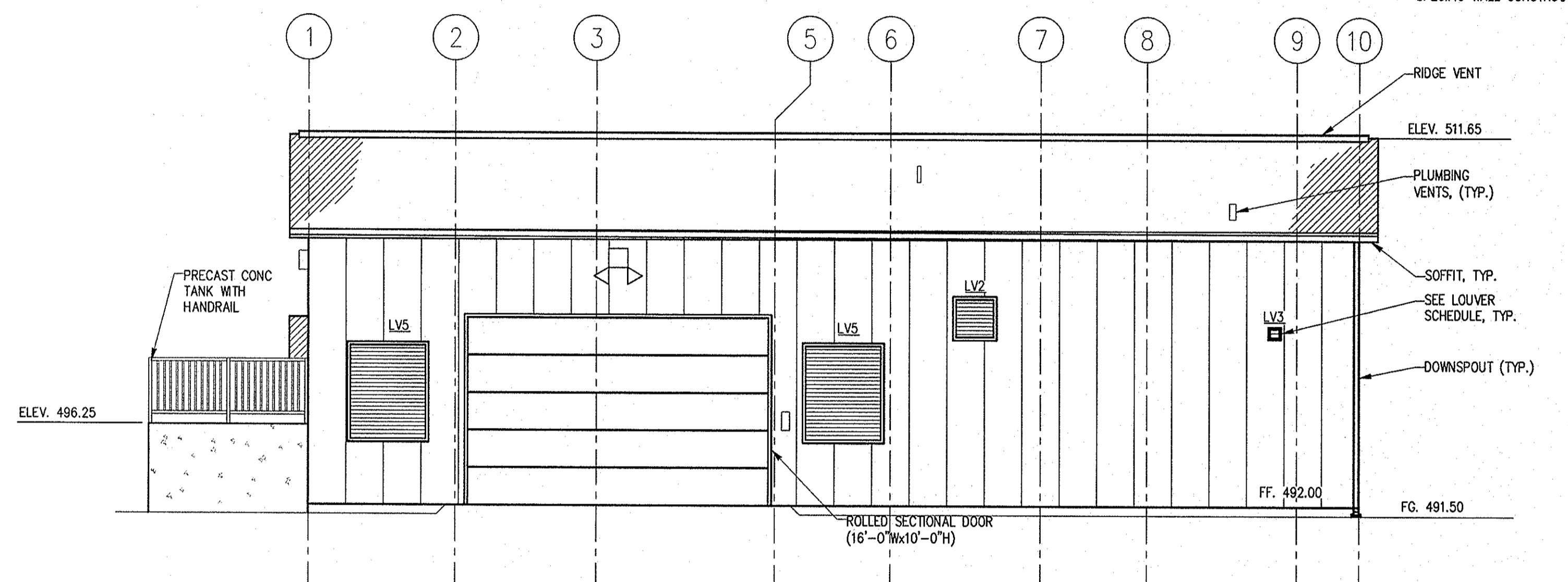
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director of Public Works: <i>[Signature]</i> 2/6/17 Chief, Bureau of Engineering: <i>[Signature]</i> 2/6/17 Chief, Utility Design Division: <i>[Signature]</i> 2/6/17	ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS KCI TECHNOLOGIES 936 RIDGEBROOK ROAD SPRINGFIELD, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com	DES: KFJ DRN: KFJ CHK: SEA DATE: AUG., 2016	KFJ JFW GW NO. 1	AS-BUILT BUILDING PERMIT COMMENTS - HO. CO. DILP NOVEMBER 21, 2018	11/21 6/20	BUILDING PLAN	ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 10 OF 43
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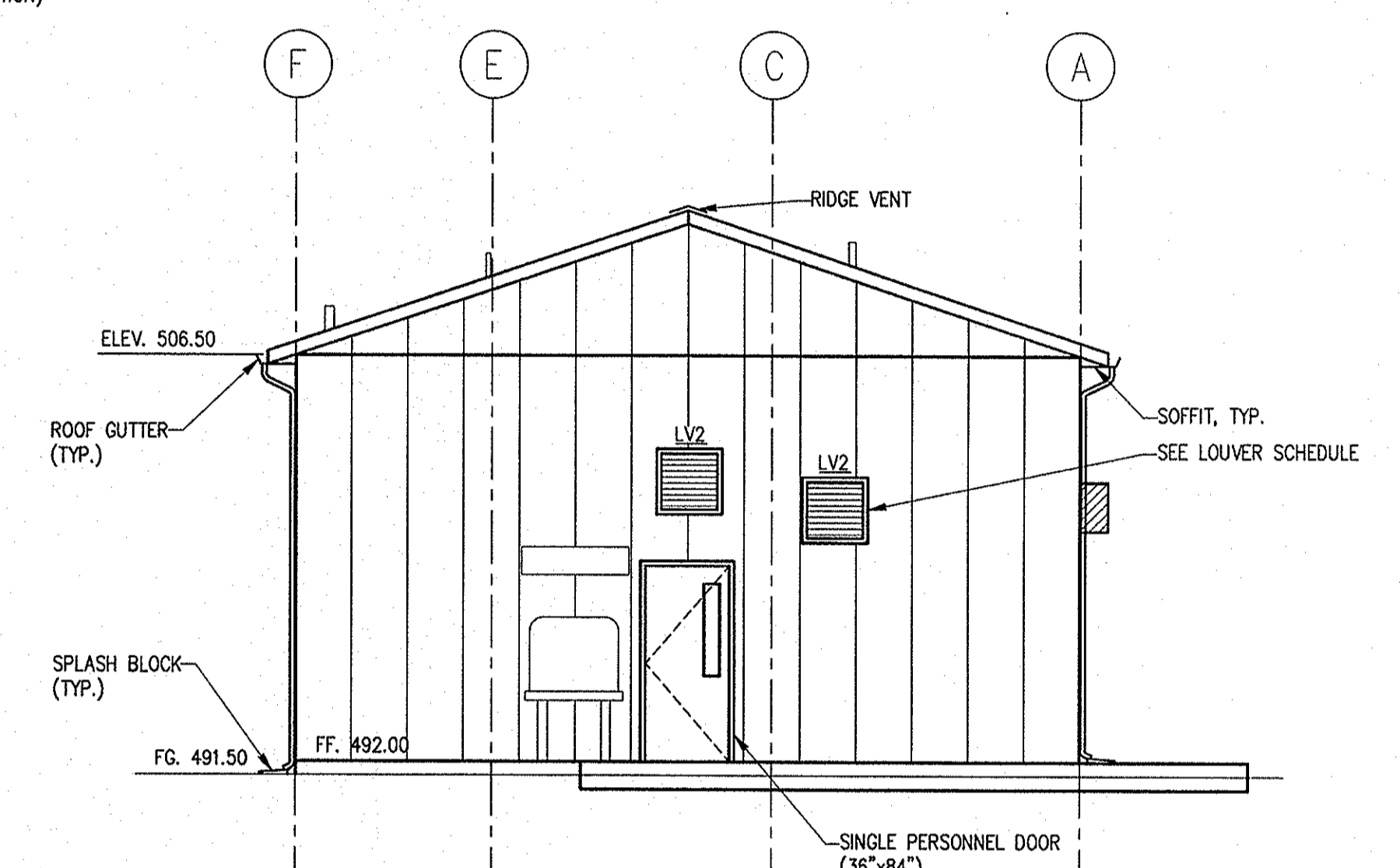
1 EAST ELEVATION
A-2 SCALE: 3/16"=1'-0"



2 NORTH ELEVATION
A-2 SCALE: 3/16"=1'-0"

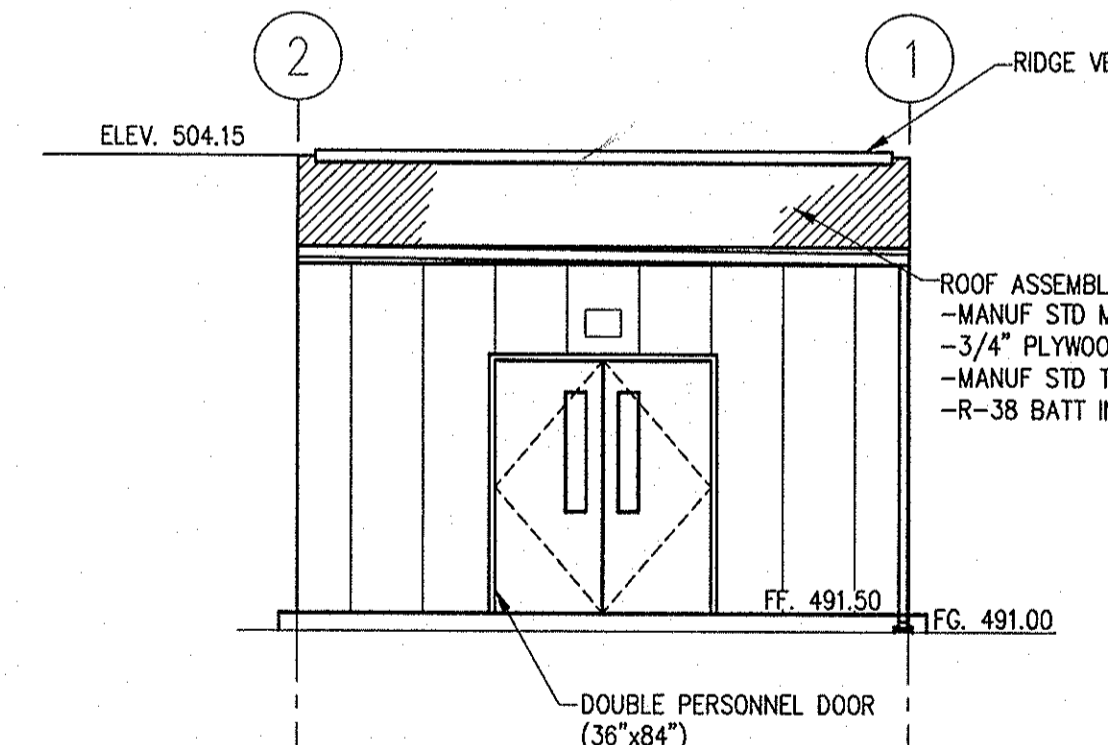


3 WEST ELEVATION
A-2 SCALE: 3/16"=1'-0"

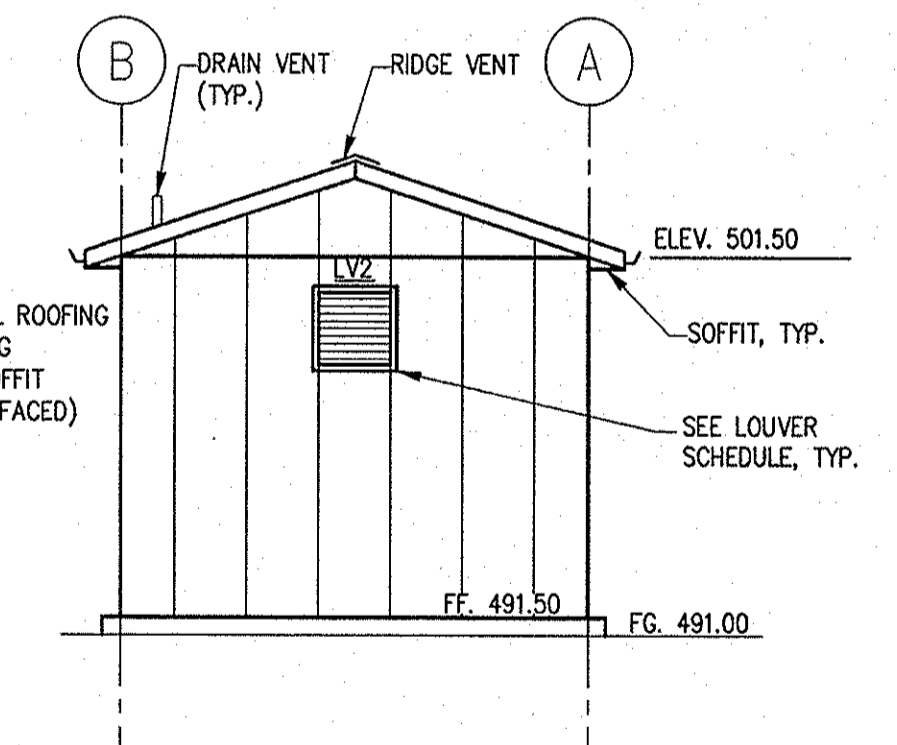


4 SOUTH ELEVATION
A-2 SCALE: 3/16"=1'-0"

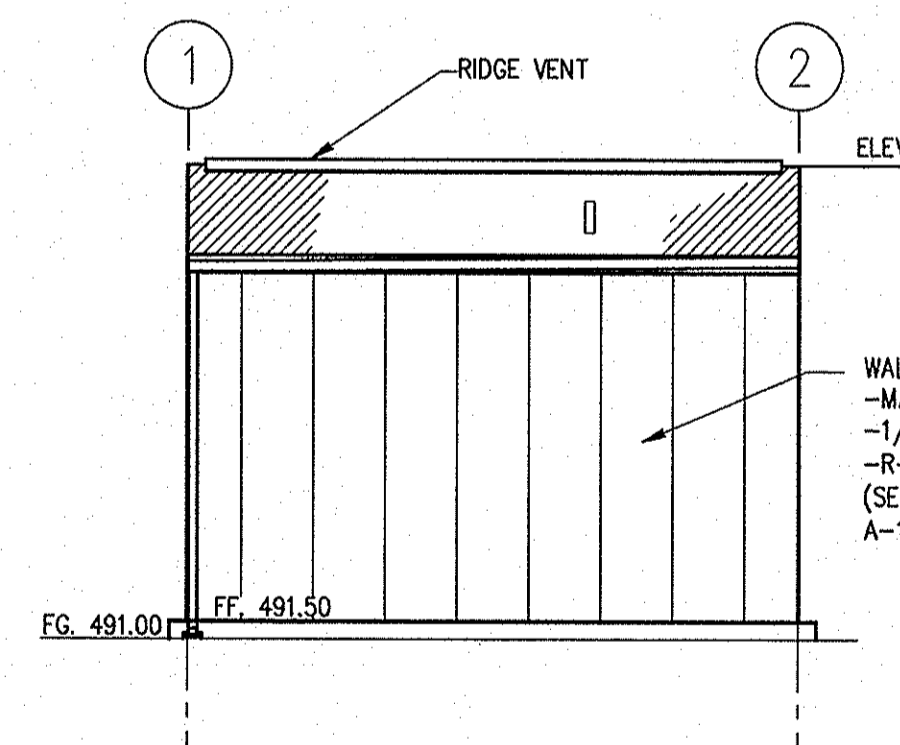
BUILDING NO.1



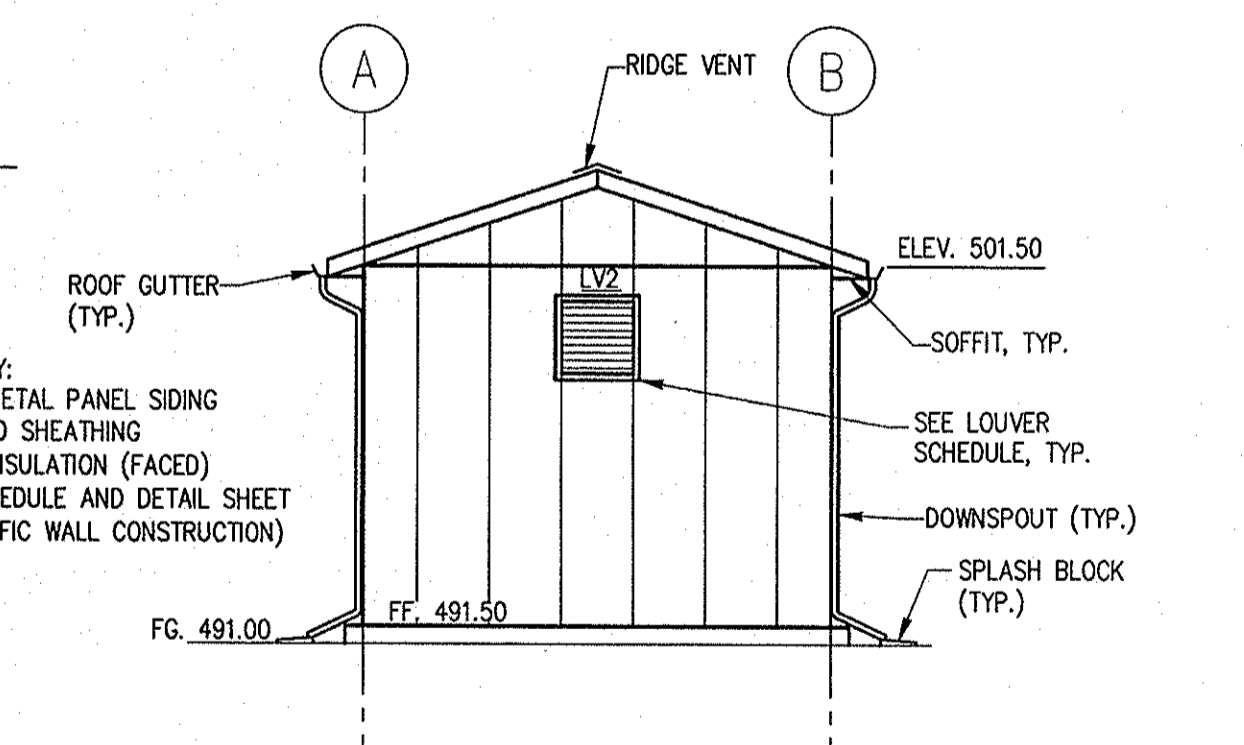
5 EAST ELEVATION
A-2 SCALE: 3/16"=1'-0"



6 SOUTH ELEVATION
A-2 SCALE: 3/16"=1'-0"



7 WEST ELEVATION
A-2 SCALE: 3/16"=1'-0"

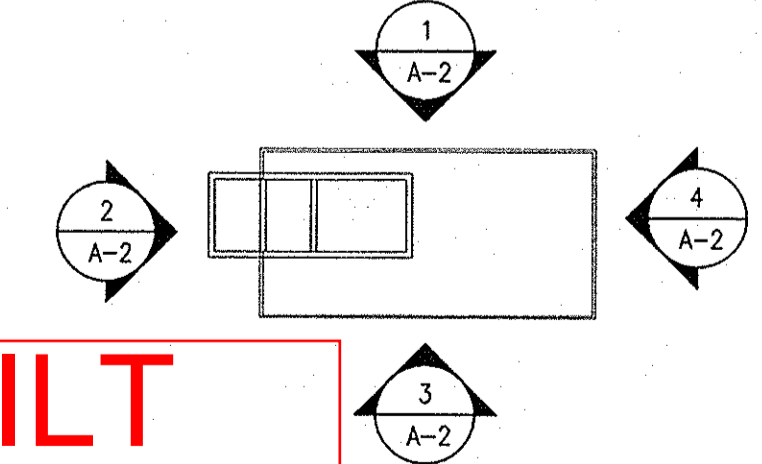


8 NORTH ELEVATION
A-2 SCALE: 3/16"=1'-0"

BUILDING NO.2

- BASIS OF DESIGN**
- SHEET METAL FLASHING AND TRIM**
 - MATERIALS:**
 - GALVANIZED STEEL SHEET: ASTM A 526, G90, COMMERCIAL QUALITY OR ASTM A 527 G90, LOCK-FORMING QUALITY, HOPT DIPPED GALVANIZED STEEL SHEET WITH 0.20 PERCENT COPPER, MILL PHOSPHATIZED WHERE INDICATED FOR PAINTING, NOT LESS THAN 0.0396 INCH THICK, UNLESS OTHERWISE NOTED.
 - BASE FLASHING: GALVANIZED STEEL, 0.0276 INCH THICK.
 - COUNTERFLASHING: GALVANIZED STEEL, 0.0217 INCH THICK.
 - CONDUCTOR HEADS: GALVANIZED STEEL, 0.0276 INCH THICK.
 - FASTENERS: SAME METAL AS SHEET METAL FLASHING OR OTHER NON-CORROSIVE METAL AS RECOMMENDED BY SHEET METAL MANUFACTURER. MATCH FINISH OF EXPOSED METAL HEADS WITH MATERIAL BEING FASTENED.
 - SEALANTS AND CAULKING**
 - COMPATIBILITY:** PROVIDE JOINT SEALERS, JOINT FILLERS, AND OTHER RELATED MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER AND WITH JOINT SUBSTRATES UNDER CONDITIONS OF SERVICE APPLICATIONS. PROVIDE COLORS TO MATCH ADJACENT SURFACES. PROVIDE BLACK OR OTHER NEUTRAL COLOR WHERE NO OTHER COLOR IS AVAILABLE.
 - MATERIALS:**
 - ONE-COMPONENT, POLYSULFIDE BASED, ONE PART ELASTOMERIC SEALANT: COMPLY WITH FS-TT-S-00230, CLASS A, TYPE II (NON-SAG). FOR JOINTS AT PENETRATIONS THROUGH EXTERIOR WALLS, PROVIDE COMPOUND BEARING THE THIOCOL CHEMICAL CORPORATION SEAL OF APPROVAL. USE ONE OF THE FOLLOWING PRODUCTS/MANUFACTURERS OR AN APPROVED EQUAL:
 - FLEXISEAL 900 SERIES BY DAP, INC.
 - HORNIFLEX ONE-COMPONENT BY W.R. GRACE & CO.
 - ONE-COMPONENT, ACRYLIC SEALANT: ACRYLIC TERPOLYMER, SOLVENT-BASED ONE-PART THERMOPLASTIC SEALANT COMPOUNDS, SOLIDS NOT LESS THAN 95% ACRYLIC. COMPLY WITH FS-TT-S-00230, CLASS B, TYPE II FOR PERIMETER OF METAL WINDOW AND DOOR FRAMES, THRESHOLDS AT EXTERIOR DOORS, AND PIPE SLEEVES THROUGH EXTERIOR WALLS AND FLOOR SLABS. USE ONE OF THE FOLLOWING PRODUCTS/MANUFACTURERS OR AN APPROVED EQUAL:
 - DAP ACRYLIC BY DAP, INC.
 - GACO AS-3 BY GATES ENGINEERING/SMC.
 - OLEO-RESINUS CAULKING COMPOUND: COMPLY WITH FS TT-C-598, NON-STAINING, NON-BLEEDING, PAINTABLE. FOR PERIMETER OF INTERIOR DOOR AND WINDOW FRAMES, USE ONE OF THE FOLLOWING PRODUCTS/MANUFACTURERS OR AN APPROVED EQUAL:
 - VULCATYX BY W.R. GRACE & CO.
 - HOLLOW METAL DOORS AND FRAMES**
 - CODES AND STANDARDS:**
 - STEEL DOOR INSTITUTE "RECOMMENDED SPECIFICATIONS FOR STANDARD STEEL DOOR AND FRAMES" (SDI 100)
 - ANSI A115 "SPECIFICATIONS FOR MINIMUM MATERIALS AND CONSTRUCTION REQUIREMENTS."
 - SUBMITTALS:**
 - SHOP DRAWINGS FOR FABRICATION AND ERECTION OF HOLLOW METAL DOORS AND FRAMES, INCLUDING DETAILS OF EACH FRAME TYPE, ELEVATIONS OF DOOR DESIGN TYPES, CONDITIONS AT OPENINGS, DETAILS OF CONSTRUCTION, LOCATION AND INSTALLATION REQUIREMENTS OF FINISH HARDWARE AND REINFORCEMENT, AND DETAILS OF JOINTS AND CONNECTIONS. SHOW ANCHORAGE AND ACCESSORY ITEMS.
 - MATERIALS:**
 - HOT-ROLLED SHEET AND STRIP: ASTM A 569 AND ASTM A 568, COMMERCIAL QUALITY CARBON STEEL, PICKLED AND OILED.
 - COLD-ROLLED STEEL SHEETS: ASTM A 366 AND ASTM A 568, COMMERCIAL QUALITY CARBON STEEL.
 - INSERTS, BOLTS, AND FASTENERS: MANUFACTURER'S STANDARD UNITS TO COMPLY WITH ASTM A 153, CLASS C OR D AS APPLICABLE.
 - SHOP APPLIED PAINT: FOR STEEL SURFACES, A RUST-INHIBITIVE ENAMEL OR PAINT, EITHER AIR-DRYING OR BAKING, SUITABLE AS A BASE FOR SPECIFIED FINISH PAINTS.
 - INSTALLATION:**
 - SUPPORTS AND ANCHORS SHALL BE FABRICATED OF STEEL NOT LESS THAN 16 GAUGE.
 - HOLLOW METAL UNITS TO BE RIGID, NEAT IN APPEARANCE, AND FREE FROM DEFECTS, WARP OR BUCKLE. WHERE PRACTICAL, FIT AND ASSEMBLE UNITS IN MANUFACTURER'S PLANT.
 - WELD EXPOSED JOINTS CONTINUOUSLY, GRIND, AND DRESS TO MAKE SURFACE SMOOTH AND FLUSH. METALLIC FILLER TO CONCEAL MANUFACTURING DEFECTS IS NOT ACCEPTABLE.
 - UNLESS OTHERWISE INDICATED, PROVIDE COUNTERSUNK FLAT PHILLIPS OR JACKSON HEADS FOR EXPOSED SCREWS AND BOLTS.
 - PREPARE HOLLOW METAL UNITS TO RECEIVE MORTISED AND CONCEALED HARDWARE, INCLUDING CUT-OUTS, REINFORCING, DRILLING, AND TAPPING IN ACCORDANCE WITH FINISH HARDWARE SCHEDULE AND ANSI A115.
 - PROVIDE REINFORCING AT HINGES IN HOLLOW METAL UNITS TO BE 7 GAUGE x 10-1/2 INCHES x WIDTH REQUIRED.
 - GYPSUM DRYWALL SYSTEM**
 - MATERIALS:**
 - MANUFACTURER: FOR ALL GYPSUM DRYWALL SYSTEMS THROUGHOUT THE PROJECT, PROVIDE ALL DRYWALL MATERIALS, INCLUDING ACCESSORIES AND FASTENERS, PRODUCED BY ONE MANUFACTURER. PROVIDE GYPSUM DRYWALL SYSTEMS MANUFACTURED BY ONE OF THE FOLLOWING, OR AN APPROVED EQUAL:
 - AMERICAN GYPSUM CO.
 - CERTANTEED CORP.
 - GEORGIA-PACIFIC GYPSUM LLC
 - STUDS AND TRACKS: ASTM C 645, SCREW TYPE.
 - JOINT TAPES: ASTM C 475, IN DRY POWDER FORM OR PRE-MIXED READY FOR APPLICATION.
 - DRYWALL FASTENERS: SIZE AND TYPE RECOMMENDED BY DRYWALL MANUFACTURER FOR THE APPLICATION SHOWN.
 - INSTALLATION:**
 - TOLERANCES FOR DRYWALL WORK: DO NOT EXCEED VARIATION OF 3/16" IN 8'-0" FROM PLUMB, LEVEL, AND FLAT IN ALL DIRECTIONS. DO NOT EXCEED 1/8" OFFSET OF PLANES AND JOINTS BETWEEN PANELS. SHIM PANELS AS NEEDED TO COMPLY WITH TOLERANCE REQUIREMENTS.
 - AT EXPOSED WALLBOARD EDGES AND AROUND OPENINGS, PROVIDE SQUARE-NOSE METAL CASING BEAD WITH EITHER KNURLED AND PERFORATED OR EXPANDED FLANGES FOR NAILING OR STAPLING, AND BEADED FOR CONCEALMENT OF FLANGES IN JOINT COMPOUND.
 - APPLY JOINT COMPOUND IN THREE COATS (NOT INCLUDING PREFILL OR OPENING IN BASE). SAND BETWEEN EACH COAT AND AFTER LAST COAT.

KEY PLAN:



NOTE:
1. SEE SPECIFICATIONS FOR GUTTER AND DOWNSPOUT FABRICATION AND INSTALLATION REQUIREMENTS.

AS-BUILT
DATE 12/2021

Refer to Rasche Brothers building drawings (Submittal 13121-001r2) for building details

11-2020 - 15-1-2021
M:\2021\01071378\05\Drawings\13121\17895_A-2.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James S. Butler 2/17
DATE
CHIEF, BUREAU OF UTILITIES

James S. Butler 2/17
DATE
CHIEF, BUREAU OF ENGINEERING

James S. Butler 2/17
DATE
CHIEF, UTILITY DESIGN DIVISION

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI
TECHNOLOGIES

936 RIDGEBOOK ROAD
SERIES, MARYLAND 21122
Telephone: (410) 316-7800
Fax: (410) 316-7818
www.kci.com

PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33925 EXPIRATION DATE: 01/15/2021

James S. Butler
6/16/20

DES: JFW	DRN: KFJ	CHK: SEA	DATE: AUG, 2016	BY NO.	REVISION	DATE
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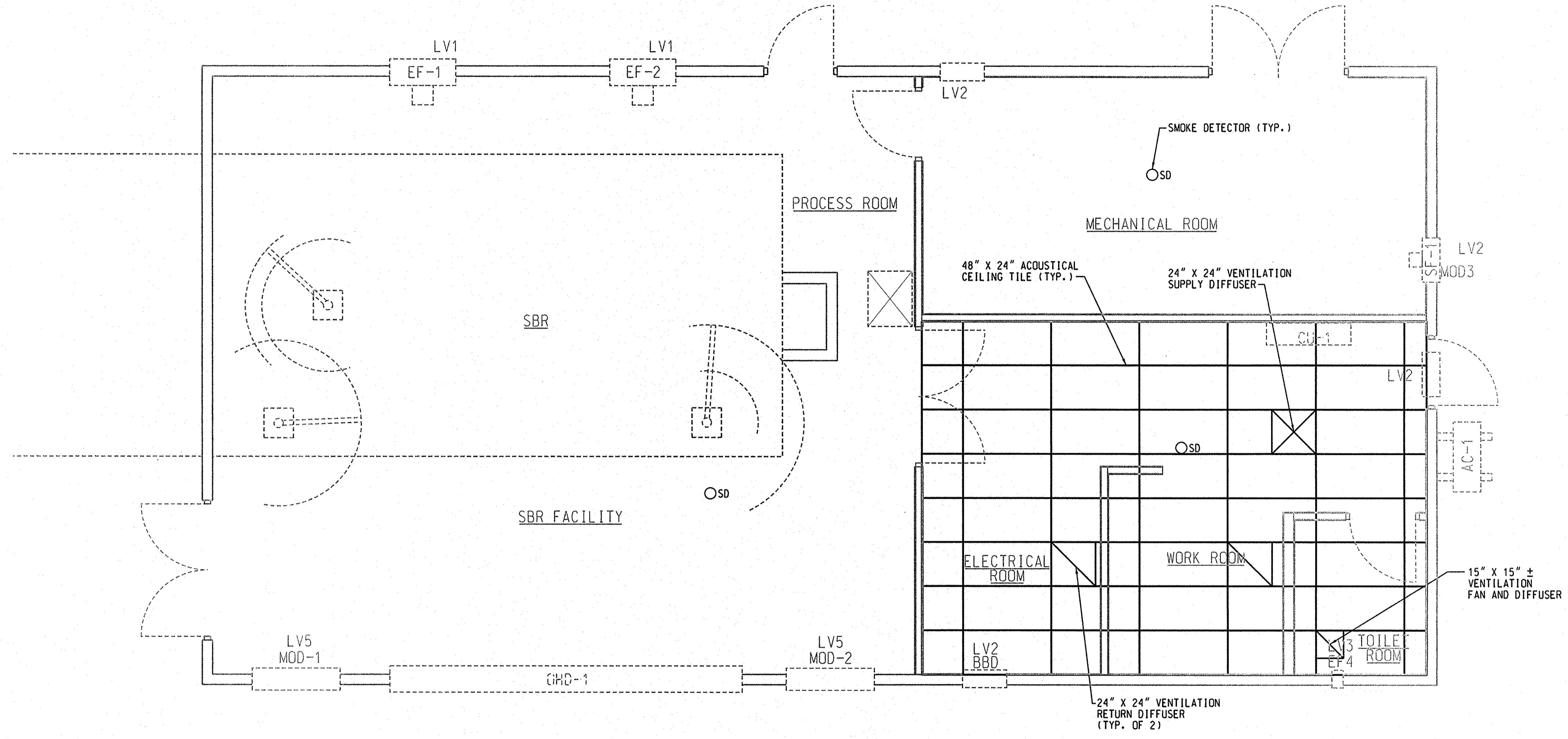
600' SCALE MAP NO. 40-41	BLOCK NO. 12
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**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT NO. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

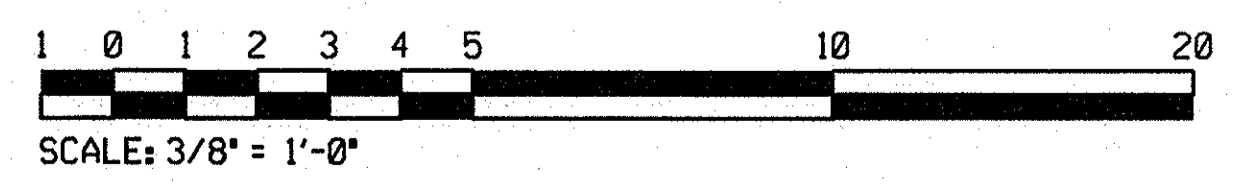
A-2
SCALE AS SHOWN
SHEET 11 OF 43



1 REFLECTED CEILING PLAN
 A-3 SCALE: 3/8" = 1'-0"



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AS-BUILT
 DATE 12/2021

PLOTTED: STATES
 FILE: SFILES

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

[Signature] 2/6/17
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/17/17
 CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/17/17
 CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

ENGINEERS
 PLANNERS
 SCIENTISTS
 CONSTRUCTION MANAGERS

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 www.kci.com

PROFESSIONAL ENGINEER
 STATE OF MARYLAND
 LICENSE NO. 33925
 EXPIRATION DATE: 01/15/2021

DES: KFJ					
DRN: KFJ					
CHK: SEA					
DATE: AUG. 2016	BY	NO.	REVISION	DATE	600' SCALE MAP NO. 40-41 BLOCK NO. 12

REFLECTED CEILING PLAN

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

A-3
 SCALE AS SHOWN
 SHEET
 12 OF 43

3

BUILDING CODES

- A. THE 2018 INTERNATIONAL BUILDING CODE (IBC) AND ALL SUBSEQUENT SUPPLEMENTS
B. GOVERNING LOCAL BUILDING CODE

DESIGN LOADS

- A. IN ADDITION TO SELF WEIGHT, THE BUILDING IS DESIGNED FOR THE FOLLOWING LOADS:

Table with columns: SLAB ON GRADE, ELEVATED PLATFORM AND STAIR, ROOF. Rows: LIVE LOAD, SUPERIMPOSED DEAD LOAD.

- B. ROOF SNOW LOAD DESIGN CRITERIA (RISK CATEGORY III):

Table with columns: GROUND SNOW LOAD (Pg), FLAT ROOF SNOW LOAD (Pf), EXPOSURE FACTOR (Ce), IMPORTANCE FACTOR (I), THERMAL FACTOR (Ct).

- C. WIND LOAD DESIGN CRITERIA (RISK CATEGORY III):

Table with columns: BASIC WIND SPEED (Vmh), WIND EXPOSURE, INTERNAL PRESSURE COEFFICIENT (GCp), COMPONENTS & CLADDING WIND PRESSURE (qc).

- D. EARTHQUAKE LOAD DESIGN CRITERIA (RISK CATEGORY III):

Table with columns: EQUIVALENT LATERAL FORCE PROCEDURE, SEISMIC DESIGN CATEGORY, IMPORTANCE FACTOR (I), MAPPED SPECTRAL RESPONSE ACCELERATIONS, DESIGN SPECTRAL RESPONSE COEFFICIENTS, SOIL SITE CLASS, SEISMIC RESPONSE COEFFICIENT (Cs), RESPONSE MODIFICATION FACTOR (R), SEISMIC RESISTING SYSTEM, DESIGN BASE SHEAR (V).

- E. THE CONTRACTOR SHALL NOT STORE ANY CONSTRUCTION MATERIALS OR UNDERTAKE ANY CONSTRUCTION OPERATION WHICH WILL EXCEED THE DESIGN LIVE LOADINGS NOTED.
F. THE STABILITY OF THE STRUCTURE IS DEPENDENT UPON THE DIAPHRAGM ACTION OF THE FLOORS AND ROOF.
G. THE FRAMING HAS BEEN DESIGNED FOR THE WEIGHT OF EQUIPMENT SHOWN ON THE STRUCTURAL DRAWINGS.
H. ALL STAIRS, RAILINGS, STUD WALLS, GLASS STORE FRONT, AND EXTERIOR CEILINGS AND SOFFITS SHALL BE DESIGNED FOR THE LOADS INDICATED OR SPECIFIED BY THE BUILDING CODE.

EXISTING STRUCTURE

- A. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY BRACING AND SHORING REQUIRED TO MAINTAIN THE STABILITY OF THE EXISTING STRUCTURE DURING CONSTRUCTION.
B. THE CONTRACTOR SHALL MONITOR THE EXISTING STRUCTURE DURING CONSTRUCTION. IMMEDIATELY NOTIFY THE ENGINEER OF AREAS EXHIBITING DISTRESS OR FAILURE.

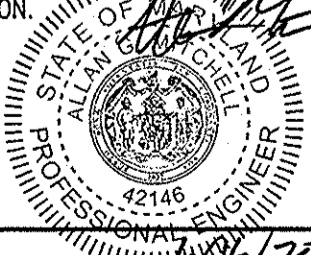
SLAB ON GRADE FOUNDATIONS

- A. REFER TO "CAST IN PLACE CONCRETE" FOR APPLICABLE CODES AND STANDARDS.
B. ASSUMED PARAMETERS FOR SPREAD FOOTING DESIGN ARE AS FOLLOWS:
1. MINIMUM DEPTH TO BOTTOM OF EXTERIOR FOOTINGS FOR FROST PROTECTION = 30 IN BELOW GRADE
2. ASSUMED NET ALLOWABLE BEARING CAPACITY = 2000 PSF
D. THE ALLOWABLE SOIL BEARING PRESSURE SHALL BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER AND APPROVED PRIOR TO PLACING FOUNDATIONS.
E. ALL EXCAVATION AND BACKFILLING OPERATIONS WITHIN THE BUILDING FOOTPRINT, INCLUDING ALL COMPACTION TESTS AND INSPECTIONS, SHALL BE DONE UNDER THE DIRECTION AND SUPERVISION OF A REGISTERED GEOTECHNICAL ENGINEER.
F. THE CONTRACTOR SHALL INFORM THE ENGINEER FOR SUBGRADE INSPECTION RESULTS FOR TANK AND BUILDING FOUNDATIONS.
G. ALL EXISTING SOIL CONTAINING GRAVEL, CONSTRUCTION OR DEMOLITION DEBRIS, ORGANIC SUBSTANCES, OR OTHER FOREIGN OBJECTS SHALL BE REMOVED FROM THE REGION WITHIN THE FOOTPRINT OF THE STRUCTURE.
H. CONTRACTOR SHALL LIMIT CUT-FILL OPERATIONS TO EXTENT POSSIBLE. STRUCTURAL BACKFILL SHALL CONSIST OF MAXIMUM 8-INCH LIFTS AND BE COMPACTED TO A MINIMUM 95% DRY DENSITY IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.

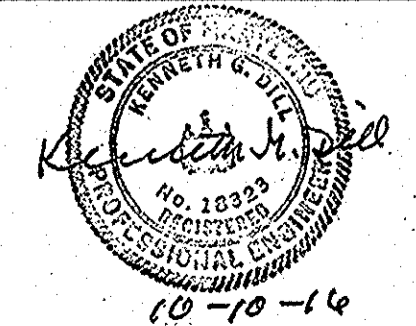
DRILLED PIER FOUNDATIONS

- A. REFER TO "CAST IN PLACE CONCRETE" FOR APPLICABLE CODES AND STANDARDS. IN ADDITION, COMPLY WITH THE FOLLOWING:
1. ACI 336.1 "STANDARD SPECIFICATION FOR THE CONSTRUCTION OF END BEARING DRILLED PIERS"
B. DESIGN PROPERTIES ASSUMED ARE AS FOLLOWS. ALL SITE PREPARATIONS SAND FIELD TESTING SHALL BE COMPLETED UNDER THE DIRECTION OF A REGISTERED GEOTECHNICAL ENGINEER.
1. DRILLED PIERS TO BEAR ON UNDISTURBED SOIL WITH NET ALLOWABLE BEARING CAPACITY OF 3000 PSF
2. BEARING ELEVATIONS OF DRILLED PIER FOUNDATIONS AS INDICATED ON DRAWINGS ARE APPROXIMATE.
3. SOIL BEARING PRESSURE SHALL BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER. CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER IF VARIATIONS OCCUR.
J. ALL CAST IN PLACE CONCRETE DRILLED PIERS SHALL CONSIST OF CONCRETE WITH A 28 DAY MINIMUM COMPRESSIVE STRENGTH OF fc = 5000 PSI. ALL REINFORCING SHALL BE ASSEMBLED AND WELDED TOGETHER TO FORM A SINGLE UNIT PRIOR TO PLACEMENT IN THE PILE EXCAVATION.

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12-16-2020



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 10-10-14



CONSTRUCTION TOLERANCES:

- 1. PERMISSIBLE VARIATION OF CENTER OF SHAFT NOT MORE THAN 3 INCHES OF PLAN LOCATION, MEASURED AT THE GROUND SURFACE.
2. SHIFTS OUT OF PLUMB NOT MORE THAN 1 INCH PER 40 FEET OF DEPTH.
3. IF TOLERANCES ARE EXCEEDED, CONTRACTOR SHALL PROVIDE CORRECTIVE CONSTRUCTION TO COMPENSATE FOR EXCESSIVE ECCENTRICITY AS APPROVED BY ENGINEER.

RETAINING WALLS

- A. REFER TO "CAST IN PLACE CONCRETE" (AND "PRECAST STRUCTURAL CONCRETE") SECTIONS FOR APPLICABLE CODES AND STANDARDS.
B. ASSUMED PARAMETERS FOR SPREAD FOOTING DESIGN ARE AS FOLLOWS:
1. MINIMUM DEPTH TO BOTTOM OF EXTERIOR FOOTINGS FOR FROST PROTECTION = 30 IN BELOW GRADE
2. ASSUMED NET ALLOWABLE BEARING CAPACITY = 2000 PSF
3. EQUIVALENT FLUID LATERAL EARTH PRESSURE FOR CANTILEVERED WALLS = 42 PCF
C. CONTRACTOR TO SUPPLY OR VERIFY BACKFILL MATERIALS WITH THE FOLLOWING CHARACTERISTICS:
1. SATURATED SOIL DENSITY: 125 PCF
2. INTERNAL FRICTION ANGLE: 30 DEGREES
3. COHESION (c): 0
4. COULOMB ACTIVE PRESSURE CONSTANT (Ka): 0.33
D. ALL RETAINING WALLS ARE DESIGNED USING THE FOLLOWING FACTORS OF SAFETY:
1. SLIDING = 1.5
2. OVERTURNING = 2.0
E. THE ALLOWABLE SOIL BEARING PRESSURE SHALL BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER AND APPROVED PRIOR TO PLACING FOUNDATIONS.
F. ALL RETAINING WALLS SHALL BE BRACED AND SHORED AS REQUIRED DURING BACKFILLING. BOTH SUPPORTING ELEMENTS SHALL BE IN PLACE AND DEVELOPING FULL REQUIRED STRENGTH PRIOR TO BACK FILLING OF WALLS SUPPORTED AT TOP AND BOTTOM.

CAST IN PLACE CONCRETE

- A. CODES AND STANDARDS:
1. ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"
2. ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
3. ACI 117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"
4. ACI 305 "RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING"
5. ACI 306 "RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING"
6. ACI 345 "RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"
7. ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
8. CRSI "MANUAL OF STANDARD PRACTICE"
B. REINFORCING MATERIALS:
1. STEEL REINFORCEMENT: ASTM A 615, GRADE 60, DEFORMED
2. PLAIN-STEEL WELDED WIRE REINFORCEMENT: ASTM A 185
C. CONCRETE MATERIALS:
1. PORTLAND CEMENT: ASTM C 150, TYPE I/II
2. FLY ASH: ASTM C 618, CLASS F
3. GROUND GRANULATED BLAST FURNACE SLAG: ASTM C 989, GRADE 120
4. NORMAL WEIGHT AGGREGATES: ASTM C 33
a. MAXIMUM COARSE AGGREGATE SIZE: 1 INCH NOMINAL
b. FINE AGGREGATE SHALL BE FREE OF MATERIAL WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT.
5. WATER: ASTM C 94, POTABLE
D. ADMIXTURES:
1. AIR ENTRAINMENT: ASTM C 260
2. WATER-REDUCER: ASTM C 494
3. SILICA FUME: ASTM C 1240
4. NO ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL BE PERMITTED.

CONCRETE MIXTURES:

- 1. FLY ASH, POZZOLAN, GROUND GRANULATED BLAST FURNACE SLAG, AND SILICA FUME MAY BE USED AS NEEDED TO REDUCE THE TOTAL AMOUNT OF PORTLAND CEMENT WHICH WOULD OTHERWISE BE USED BY NOT MORE THAN 40 PERCENT.
a. MAXIMUM SUBSTITUTION OF FLY ASH SHALL BE 20 PERCENT.
b. MAXIMUM SUBSTITUTION OF SILICA FUME SHALL BE 10 PERCENT.

PROPORTION NORMAL WEIGHT CONCRETE MIXES AS FOLLOWS:

Table with columns: LOCATION, 28 DAY STRENGTH (fc), WATER-CEMENTIOUS RATIO, SLUMP LIMIT, AIR CONTENT. Rows: FOUNDATIONS, SLABS ON GRADE.

ALL CONCRETE MIX DESIGNS, INCLUDING CEMENT CONTENT, WATER CEMENT RATIO, FINE AND COARSE AGGREGATE CONTENT AND ALL ADMIXTURES, SHALL BE REVIEWED BY ENGINEER PRIOR TO PLACING FIRST CONCRETE.

- H. ALL CONCRETE SHALL BE SAMPLED AND TESTED BY THE TESTING AGENCY. THE CONTRACTOR SHALL NOTIFY THE TESTING AGENCY 48 HOURS PRIOR TO THE PLACING OF ANY CONCRETE.

- I. MINIMUM COVER FOR ALL REINFORCING SHALL BE AS FOLLOWS UNLESS OTHERWISE INDICATED:
FOUNDATIONS 3 INCHES
SLABS ON GRADE 2 INCHES (TOP)

PRECAST STRUCTURAL CONCRETE

- A. REFER TO "CAST IN PLACE CONCRETE" SECTION FOR APPLICABLE CODES AND STANDARDS.
B. REFER TO "DESIGN LOADS" FOR STRUCTURAL PERFORMANCE REQUIREMENTS OF STRUCTURAL CONCRETE UNITS AND CONNECTIONS.
C. SUBMITTALS:
1. DESIGN MIXTURES FOR EACH PRECAST CONCRETE MIX, INCLUDING COMPRESSIVE STRENGTH AND WATER-ABSORPTION TESTS
2. COMPLETE DESIGN CALCULATIONS AND SHOP DRAWINGS SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER
D. ALL PRECAST CONCRETE ELEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI. HIGHER STRENGTH CONCRETE MAY BE USED IF REQUIRED BY DESIGN.
E. TOPPING SLABS FOR ALL PRECAST FLOOR AND ROOF SYSTEMS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI.
F. THE CONTRACTOR SHALL NOT CUT ANY OPENINGS INTO THE PRECAST CONCRETE ELEMENTS WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER AND PRECAST MANUFACTURER.

STRUCTURAL AND MISCELLANEOUS STEEL

- A. CODES AND STANDARDS:
1. AISC "STEEL CONSTRUCTION MANUAL" 15TH EDITION.
2. AISC 303 "CODE OF STANDARD PRACTICE FOR BUILDINGS AND BRIDGES"
3. AISC 308 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
4. RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A 325 OR A 490 BOLTS"
5. AWS D1.1 "STRUCTURAL WELDING CODE"
6. AISC "SPECIFICATION FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL"
B. SUBMITTALS:
1. SHOP DRAWINGS INDICATING THE SIZES, EXTENT, AND LOCATION OF ALL STRUCTURAL AND MISCELLANEOUS STEEL FRAMING INCLUDING ALL CONNECTIONS, FASTENERS, AND BEARINGS.

- C. MATERIALS:
1. W-SHAPES: ASTM A 992
2. CHANNELS, ANGLES, PLATES: ASTM A 36
3. HOLLOW STRUCTURAL SECTIONS (HSS): ASTM A 500, GRADE B
4. STEEL PIPE: ASTM A 53, TYPE E OR S, GRADE B
5. PRIMER: FABRICATOR'S STANDARD LEAD AND CHROMATE FREE, NONASPHALTIC, RUST INHIBITING, COMPLY WITH MF#79
6. NON-METALLIC, SHRINKAGE RESISTANT GROUT: ASTM C 1107 WITH MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS
7. GALVANIZE: HOT-DIP ZINC COATING, ASTM A 123

- D. CONNECTIONS:
1. WELDED CONNECTIONS: E70XX ELECTRODES
2. HIGH-STRENGTH BOLTS: ASTM A 325, TYPE 1, HEAVY-HEX STEEL STRUCTURAL BOLTS

- E. INSTALLATION:
1. ALL CONNECTIONS, UNLESS OTHERWISE NOTED, SHALL BE DOUBLE ANGLE OR SINGLE PLATE SHEAR CONNECTIONS DESIGNED AND DETAILED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION.
a. MINIMUM EDGE DISTANCE: 1 1/2 INCHES
b. BOLT SPACING: 3 INCHES
2. BEAM CONNECTIONS SHALL USE NO LESS THAN TWO 3/4" DIAMETER ASTM A 325N OR A 490 HIGH STRENGTH BOLTS.
3. ALL SHOP AND FIELD WELDS SHALL BE PERFORMED BY CERTIFIED WELDERS.
4. WELDS SHALL DEVELOP THE FULL STRENGTH OF MATERIALS BEING WELDED UNLESS OTHERWISE INDICATED.
5. THE CONTRACTOR SHALL NOT SPLICE OR CUT OPENINGS IN STEEL MEMBERS NOT SHOWN ON CONTRACT DRAWINGS WITHOUT THE PERMISSION OF THE STRUCTURAL ENGINEER.

METAL GRATING

- A. REFER TO "STRUCTURAL STEEL" SECTION FOR APPLICABLE CODES AND STANDARDS. IN ADDITION, COMPLY WITH THE FOLLOWING:

- 1. NAAMM - MBG 531 "METAL BAR GRATING MANUAL"
B. SUBMITTALS:
1. SHOP DRAWINGS INDICATING LAYOUT, MATERIAL PROPERTIES OR LOAD TABLES, ANCHORAGE DETAILS, PANS, AND ACCESSORIES.
2. PRODUCT DATA AND STRUCTURAL LOAD TABLES FOR GRATING.
3. PRODUCT DATA AND STRUCTURAL LOAD TABLES OF MECHANICAL FASTENERS, IF APPLICABLE.
C. MATERIALS:
1. GALVANIZED AND PRIME PAINTED STEEL BAR GRATING: ASTM A 653, STRUCTURAL STEEL, GRADE 33, O80 ZINC COATING
2. ALUMINUM EXTRUDED BARS AND SHAPES: ASTM B2.21, ALLOYS 6061-76 OR 6063-T6 FOR BEARING BARS ALLOY 6061-T1 FOR CROSS BAR
3. FASTENER: TYPE 316 STAINLESS STEEL
D. INSTALLATION:
1. COMPLY WITH RECOMMENDATIONS OF REINFORCED STANDARDS AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
2. ATTACH REMOVABLE UNITS TO SUPPORTING MEMBERS BY WELDING UNLESS OTHERWISE NOTED.

ALUMINUM STAIRS

- A. REFER TO ARCHITECTURAL DRAWINGS FOR RISERS, TREADS, AND LANDING REQUIREMENTS.
B. SUBMITTALS:
1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER FOR ALL STEEL STAIRS.
C. STRUCTURAL PERFORMANCE REQUIREMENTS:
1. ALL STAIR FRAMING SHALL BE DESIGNED BY THE CONTRACTOR TO SUPPORT ALL DEAD LOADS PLUS A MINIMUM LIVE LOADING OF 100 PSF.
D. INSTALLATION:
1. THE CONTRACTOR SHALL PROVIDE ALL STEEL HANGERS, CLIP ANGLES ETC., AS REQUIRED TO SUPPORT THE STAIR FRAMING.

WOOD FRAMING

- A. CODES AND STANDARDS:
1. "NATIONAL DESIGN SPECIFICATIONS" PUBLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION.
2. NIST'S VOLUNTARY PRODUCT STANDARD DOC PS 20 "AMERICAN SOFTWOOD LUMBER STANDARD"
3. NIST'S VOLUNTARY PRODUCT STANDARD DOC PS 2 "PERFORMANCE STANDARD FOR WOOD BASED STRUCTURAL PANELS"
4. TRUSS PLATE INSTITUTE'S "DESIGN SPECIFICATIONS FOR LIGHT METAL PLATE CONNECTED WOOD TRUSSES"
5. AMERICAN WOOD PROTECTION ASSOCIATION (AWPA) STANDARD
B. MATERIALS (UNADJUSTED VALUES FOR 12" DEPTH):
1. DIMENSION LUMBER: NO. 2 HEM-FIR AT 19 PERCENT MOISTURE CONTENT OR APPROVED EQUAL
Fb : Fv : Fc(perp) : Fc(parallel) : Ft : E :
850 PSI 150 PSI 405 PSI 1300 PSI 525 PSI 1300 KSI
2. ENGINEERED WOOD PRODUCTS:
LAMINATED VENEER LUMBER (LVL):
Fb : Fv : Fc(perp) : Fc(parallel) : Ft : E :
2600 PSI 285 PSI 750 PSI 2510 PSI 1555 PSI 1900 KSI
LAMINATED STRAND LUMBER (LSL):
Fb : Fv : Fc(perp) : Fc(parallel) : Ft : E :
2600 PSI 400 PSI 880 PSI 2380 PSI 1825 PSI 1700 KSI
PARALLEL STRAND LUMBER (PSL):
Fb : Fv : Fc(perp) : Fc(parallel) : Ft : E :
2900 PSI 290 PSI 750 PSI 2900 PSI 2025 PSI 2000 KSI
3. PRESERVATIVE TREATMENT BY PRESSURE PROCESS (P.T.) LUMBER: AWP A U1
a. INTERIOR CONSTRUCTION NOT IN CONTACT WITH GROUND: USE CATEGORY UC2
b. EXTERIOR CONSTRUCTION NOT IN CONTACT WITH GROUND: USE CATEGORY UC3B
c. ALL CONSTRUCTION IN CONTACT WITH GROUND: USE CATEGORY UCA4
4. ROOF SHEATHING: EXTERIOR, STRUCTURAL 1 PLYWOOD OR OSB SHEATHING, FOR SPANS SHOWN ON DRAWINGS

AS-BUILT DATE 12/2021

Jun 11, 2020 - 5:03pm User: Alan.Mitchell File: 2007-01071278-06-Drawing-Structural-01071278-06-S-0.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Includes signatures and dates for Director of Public Works, Chief, Bureau of Engineering, and Chief, Utility Design Division.

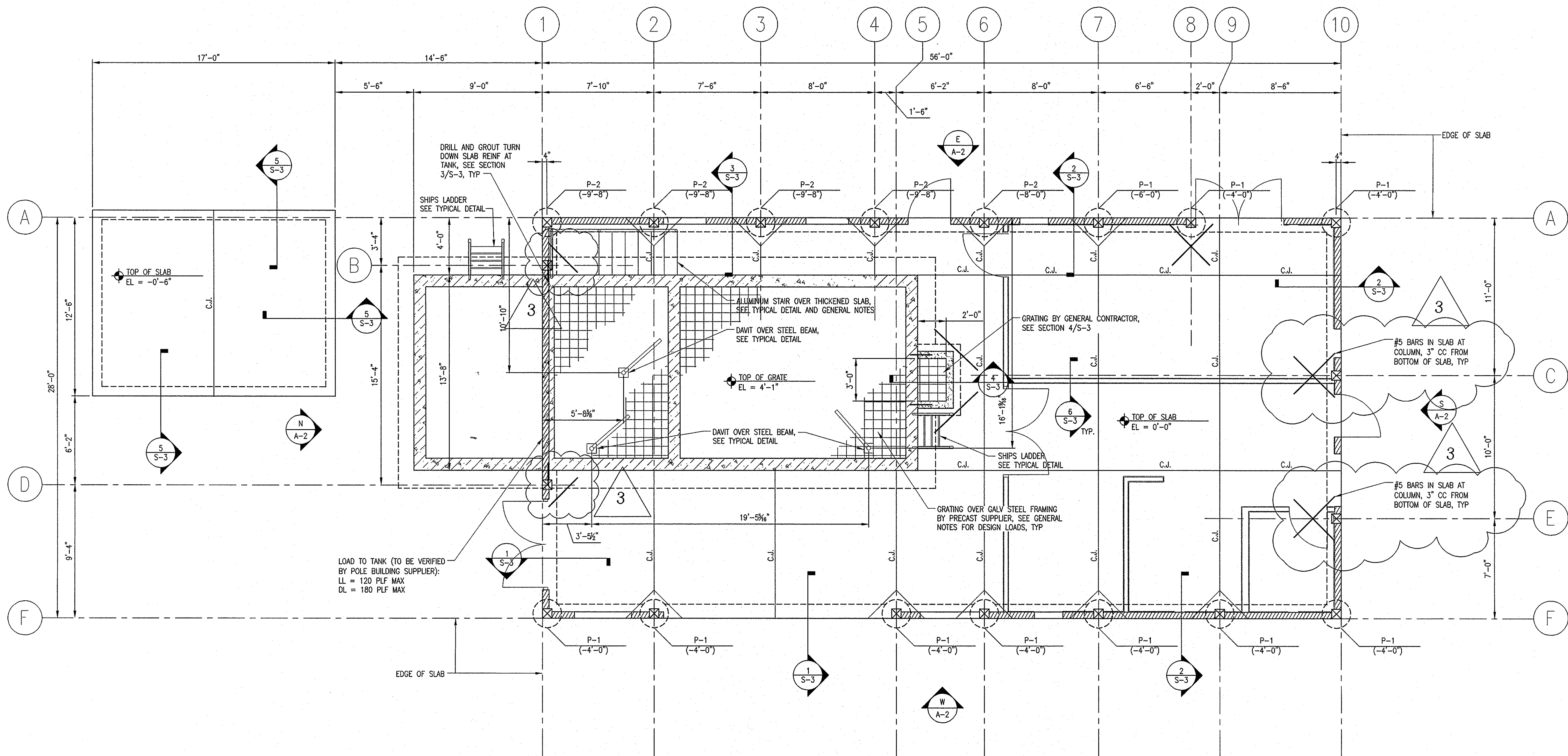
KCI TECHNOLOGIES. Includes logo and contact information for Construction Managers.

Professional Engineer Seal for Ashley Knolls, License No. 10-10-14.

Table with columns: DES, DRN, CHK, DATE, BY, NO. Rows: NB, PB, LH, AGM, BUILDING PERMIT COMMENTS - HO. CO. DILP, 6/20, AUG, 2016.

Table with columns: REVISION, DATE. Row: 600' SCALE MAP NO. 40-41, BLOCK NO. 12.

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY. CAPITAL PROJECT No. S-6269. CONTRACT No. 50-4972. ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND. Includes scale and sheet information.



SLAB ON GRADE AND FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

DRILLED CONCRETE PIER SCHEDULE
ASSUMED ALLOWABLE END BEARING = 3000 PSF

MARK	SIZE	PIER REINFORCING	TIES
P-1	24" DIA	8-#5	#3 @ 16"
P-2	24" DIA	8-#7	#3 @ 16"

FOUNDATION AND SLAB ON GRADE NOTES

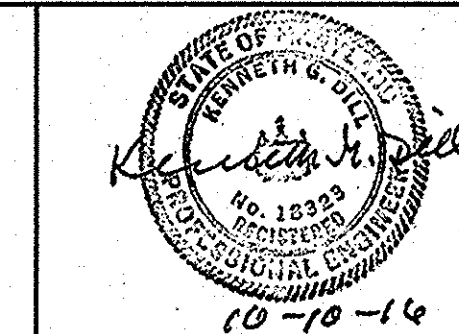
- SCOPE OF WORK IS TO PLACE FOUNDATIONS FOR PRECAST CONCRETE TANK, PARTIALLY BURIED; PRE-ENGINEERED WOOD POLE STRUCTURE; AND PRE-ENGINEERED WOOD BEARING WALL STRUCTURE. PRECAST TANK SHALL INCLUDE CONCRETE LID (EXTERIOR) AND METAL GRATE WITH SUPPORTS (INTERIOR) IN ACCORDANCE WITH SPECIFICATIONS. COORDINATE CONNECTION DETAILS FOR ALL THREE STRUCTURES WITH MANUFACTURER PRIOR TO INSTALLATION.
- SLAB ON GRADE SHALL CONSIST OF 5" THICK NORMAL WEIGHT CONCRETE REINFORCED WITH 6"x6" - W2.9x2.9 WELDED WIRE FABRIC (WWF). PLACE SLAB ON GRADE OVER MINIMUM 6" CRUSHED #57 STONE AND 10 MIL VAPOR BARRIER.
- TYPICAL TOP OF SLAB ELEVATION = 492.00' (DATUM 0'-0")
- TYPICAL DRILLED CONCRETE PIERS ARE INDICATED ON PLAN THUS: P-X. REFER TO PIER SCHEDULE AND TYPICAL DETAILS FOR MORE INFORMATION.
- TYPICAL TOP OF PIER ELEVATION IS 0'-0". BOTTOMS OF PIERS ARE NOTED ON PLAN THUS (X'-X") AND MEASURED FROM DATUM 0'-0".
- CONTROL JOINTS ARE INDICATED ON PLAN THUS: C.J. REFER TO TYPICAL SLAB ON GRADE DETAILS FOR MORE INFORMATION.
- FOUNDATIONS ARE DESIGNED FOR PRELIMINARY SERVICE LOADS. CONTRACTOR SHALL SUBMIT REACTIONS FOR COLUMNS PRIOR TO PLACEMENT OF FOUNDATIONS.

AS-BUILT
DATE 12/2021

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42146, EXPIRATION DATE: 12-13-2020.



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18323, EXPIRATION DATE: 07-05-2017.



KCI TECHNOLOGIES
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SCIENTISTS
CONSTRUCTION MANAGERS
936 RIDGEBROOK ROAD
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TELEPHONE (410) 316-7800
FAX (410) 316-7818
WWW.KCI.COM

DES: NB			
DRN: PB			
CHK: LH			
DATE: AUG, 2016	AGM BY NO.	BUILDING PERMIT COMMENTS - HO. CO. DILP REVISION	6/20

SLAB ON GRADE AND FOUNDATION PLAN
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

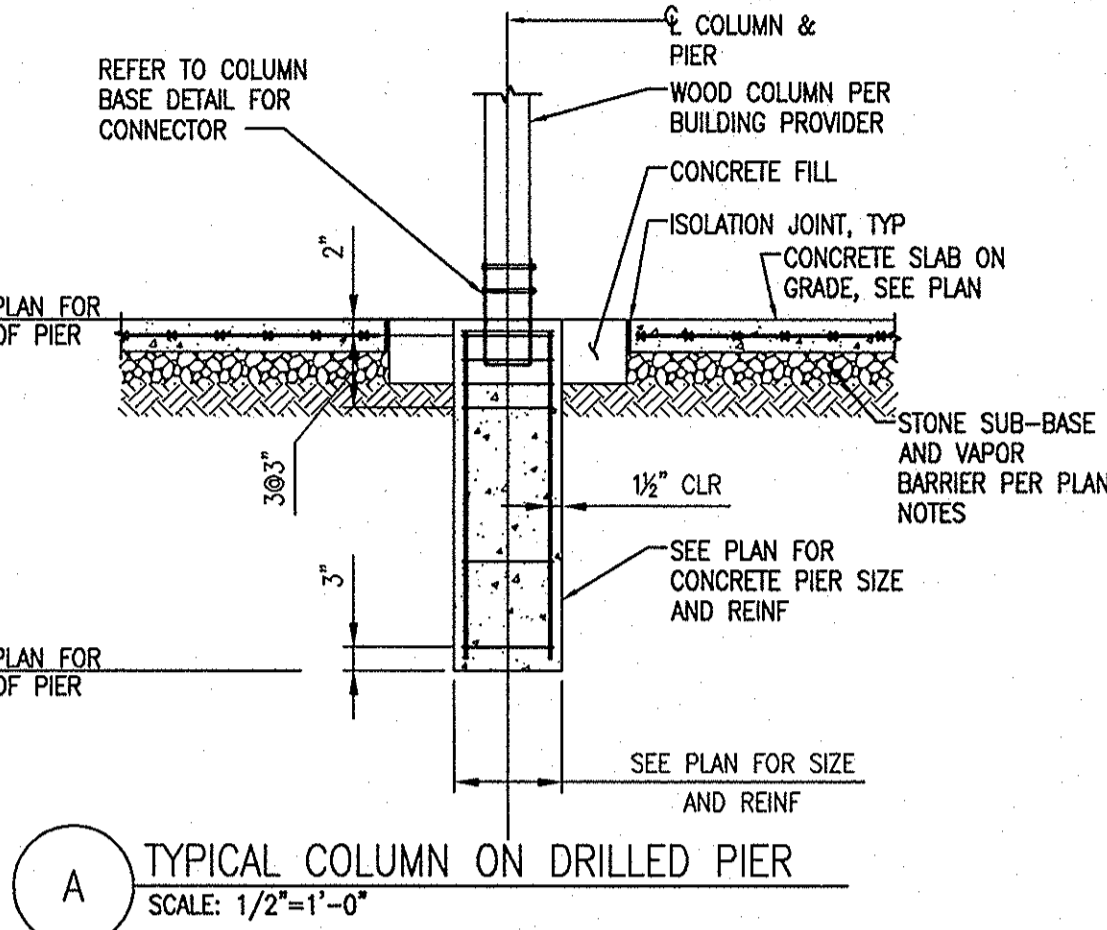
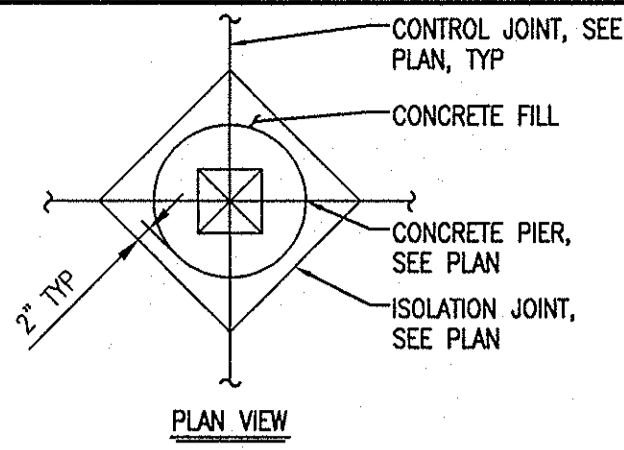
S-1
SCALE AS SHOWN
SHEET
14 OF 43

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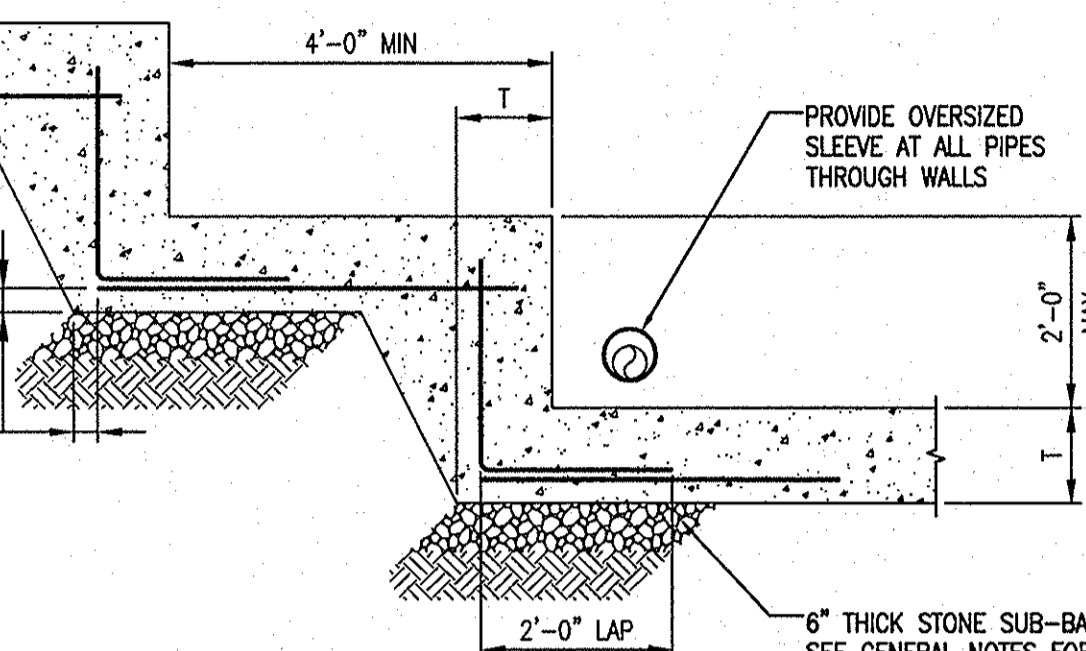
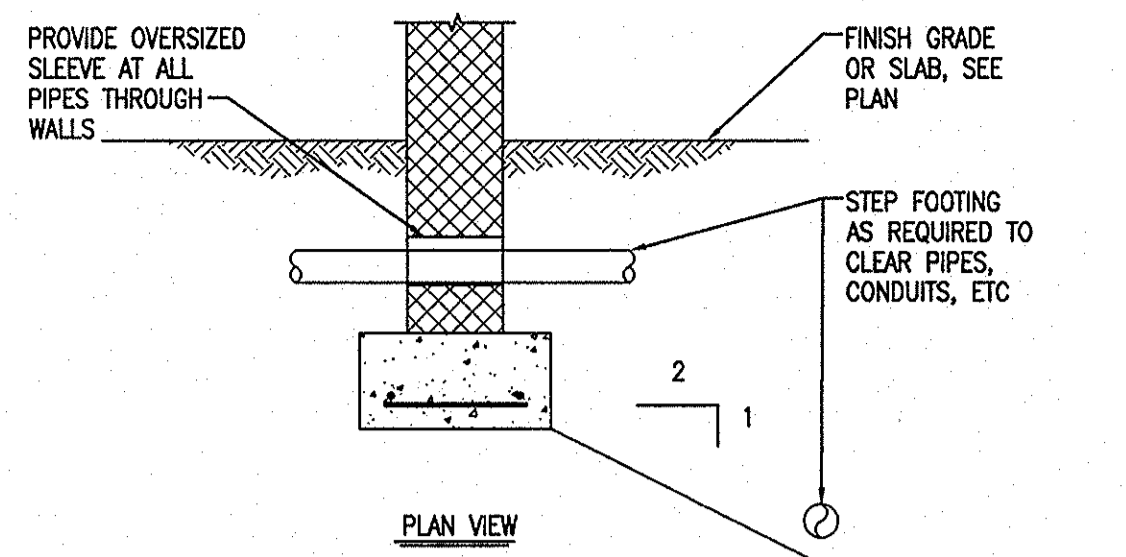
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *Janet De...* 2/16/21
Chief, Bureau of Utilities: *...* 1/25/17

Chief, Bureau of Engineering: *Thomas E. Butler* 2/13/17
Chief, Utility Design Division: *...* 2/13/17

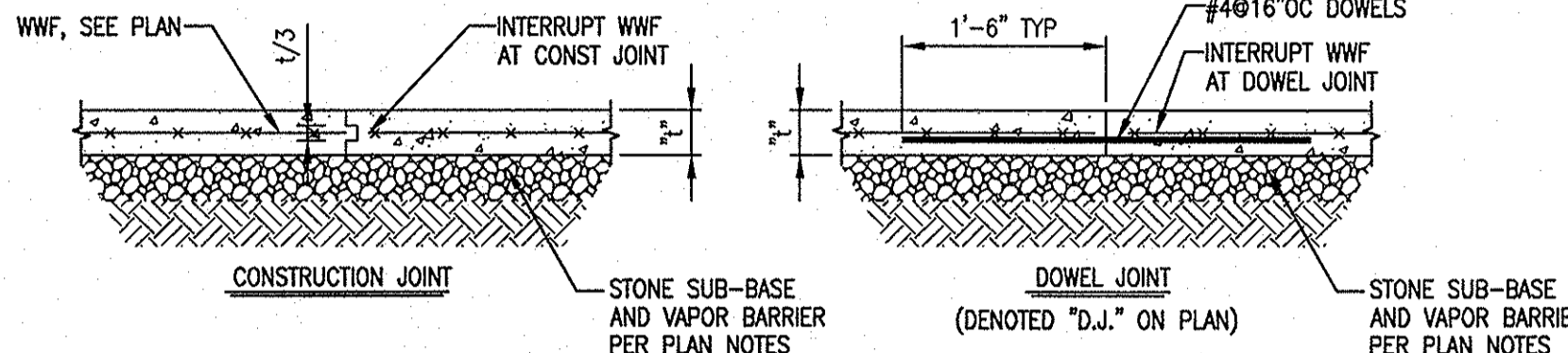
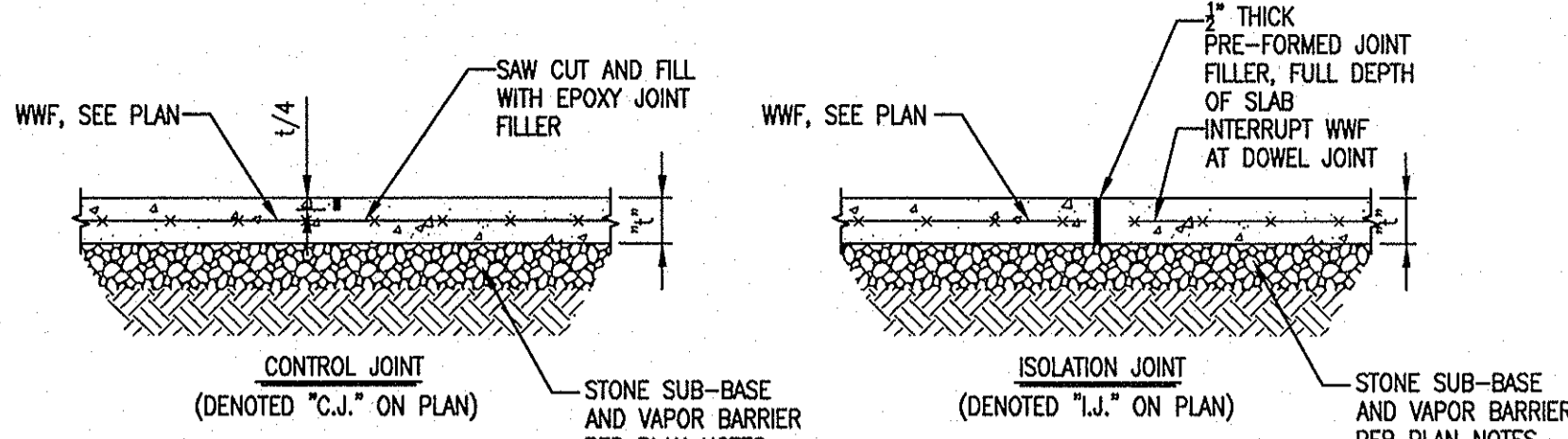


A TYPICAL COLUMN ON DRILLED PIER
SCALE: 1/2"=1'-0"

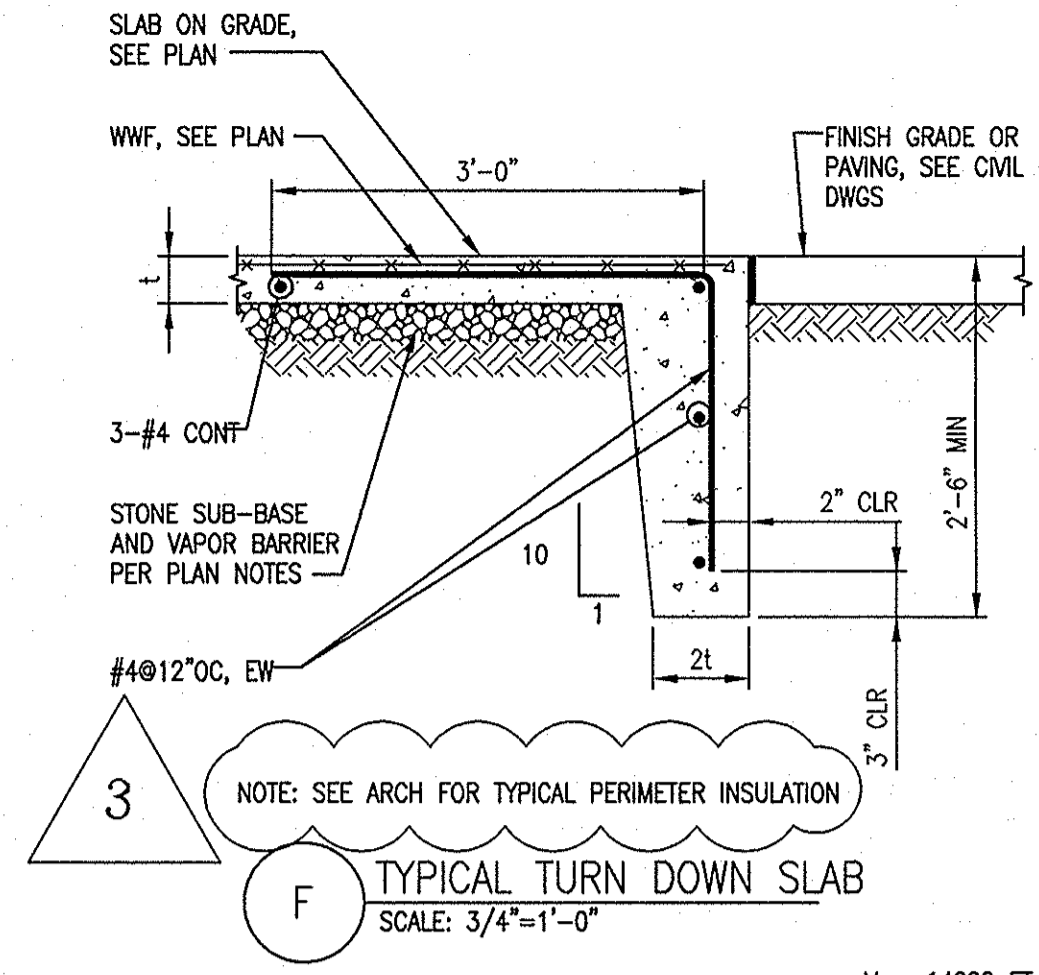


C TYPICAL STEPPED WALL FOOTING
SCALE: 1/2"=1'-0"

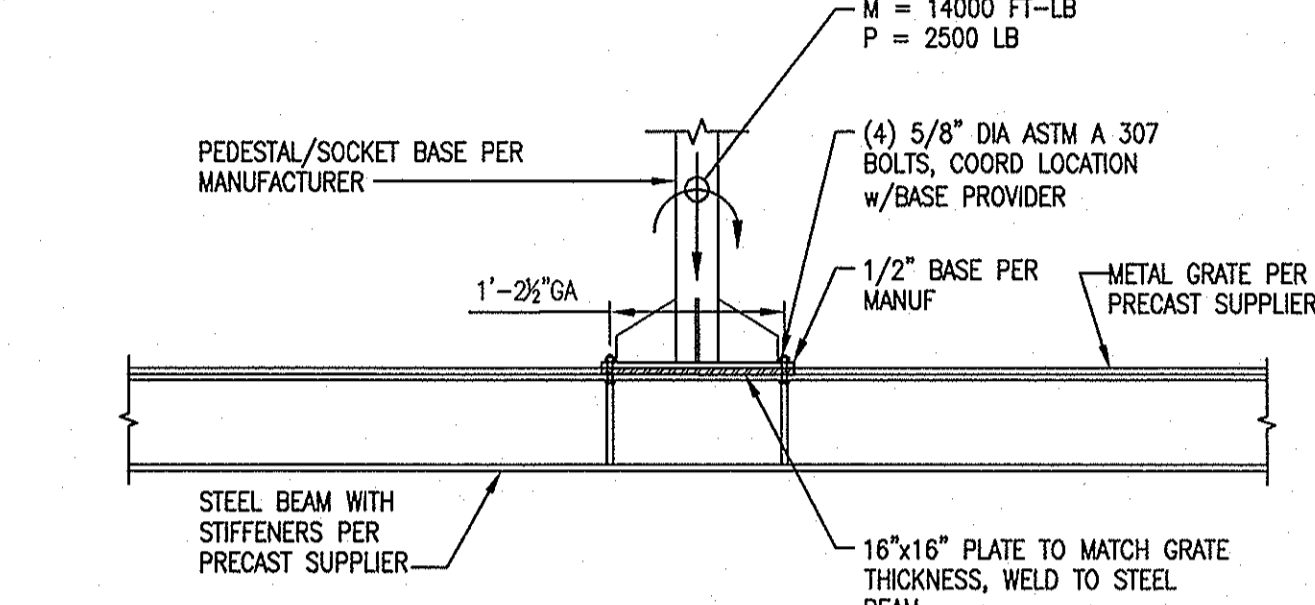
D TYPICAL THICKENED SLAB AT STAIR
SCALE: 3/4"=1'-0"



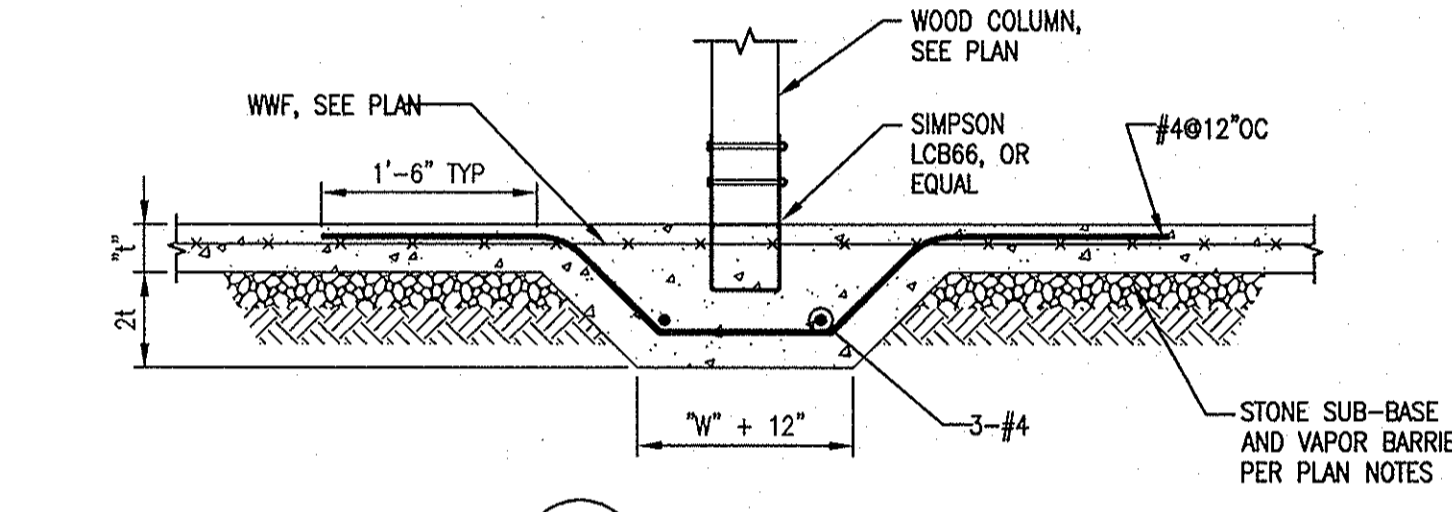
E TYPICAL SLAB ON GRADE DETAILS
SCALE: 3/4"=1'-0"



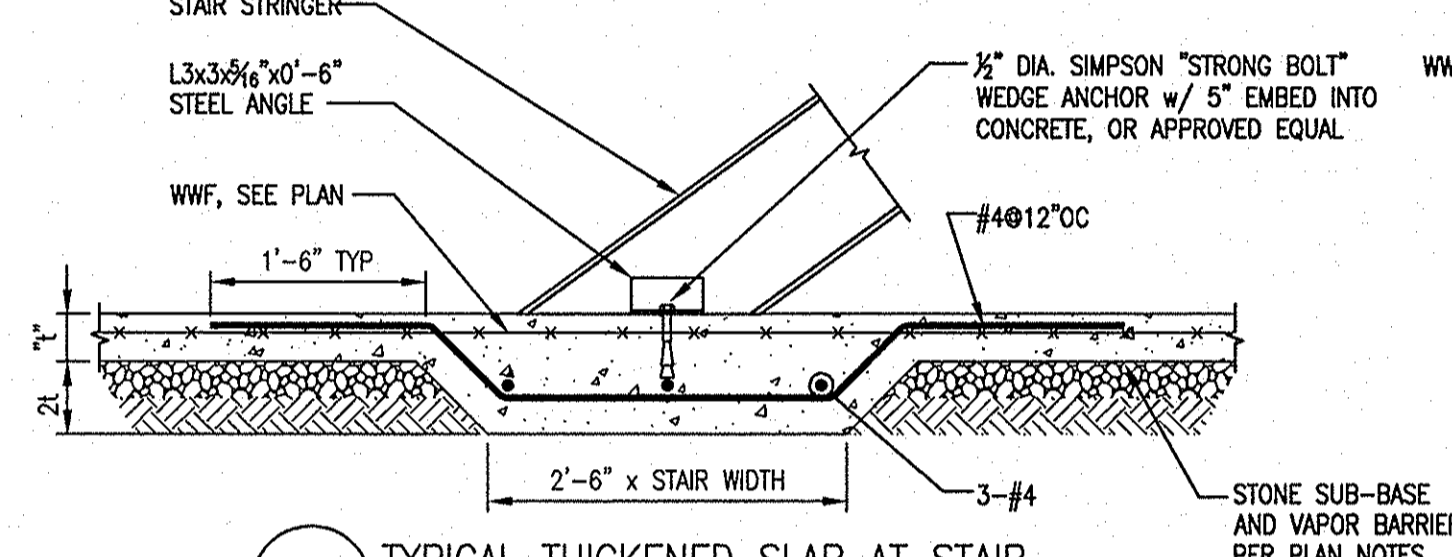
F TYPICAL TURN DOWN SLAB
SCALE: 3/4"=1'-0"



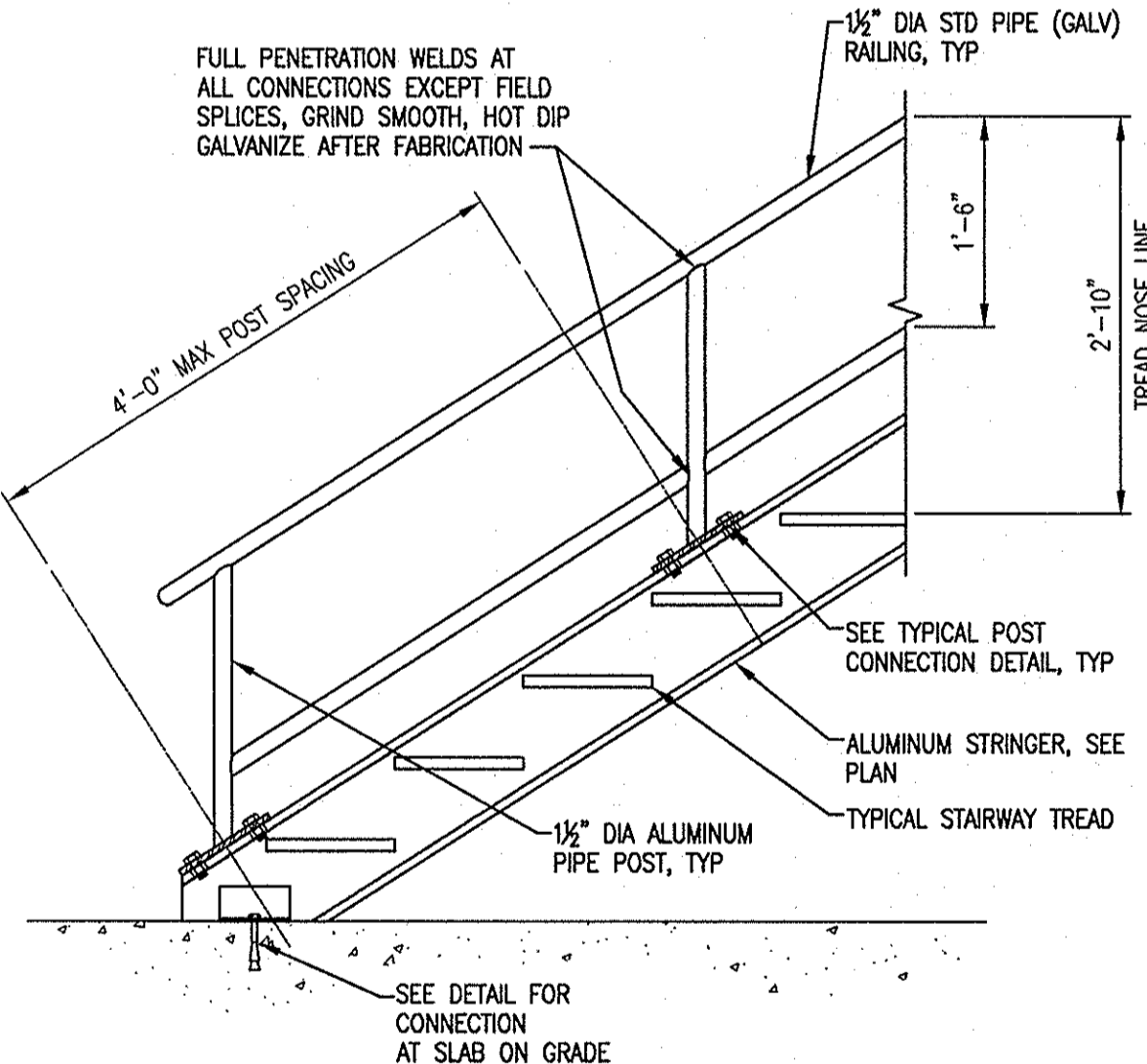
G DAVIT SUPPORT
SCALE: 3/4"=1'-0"



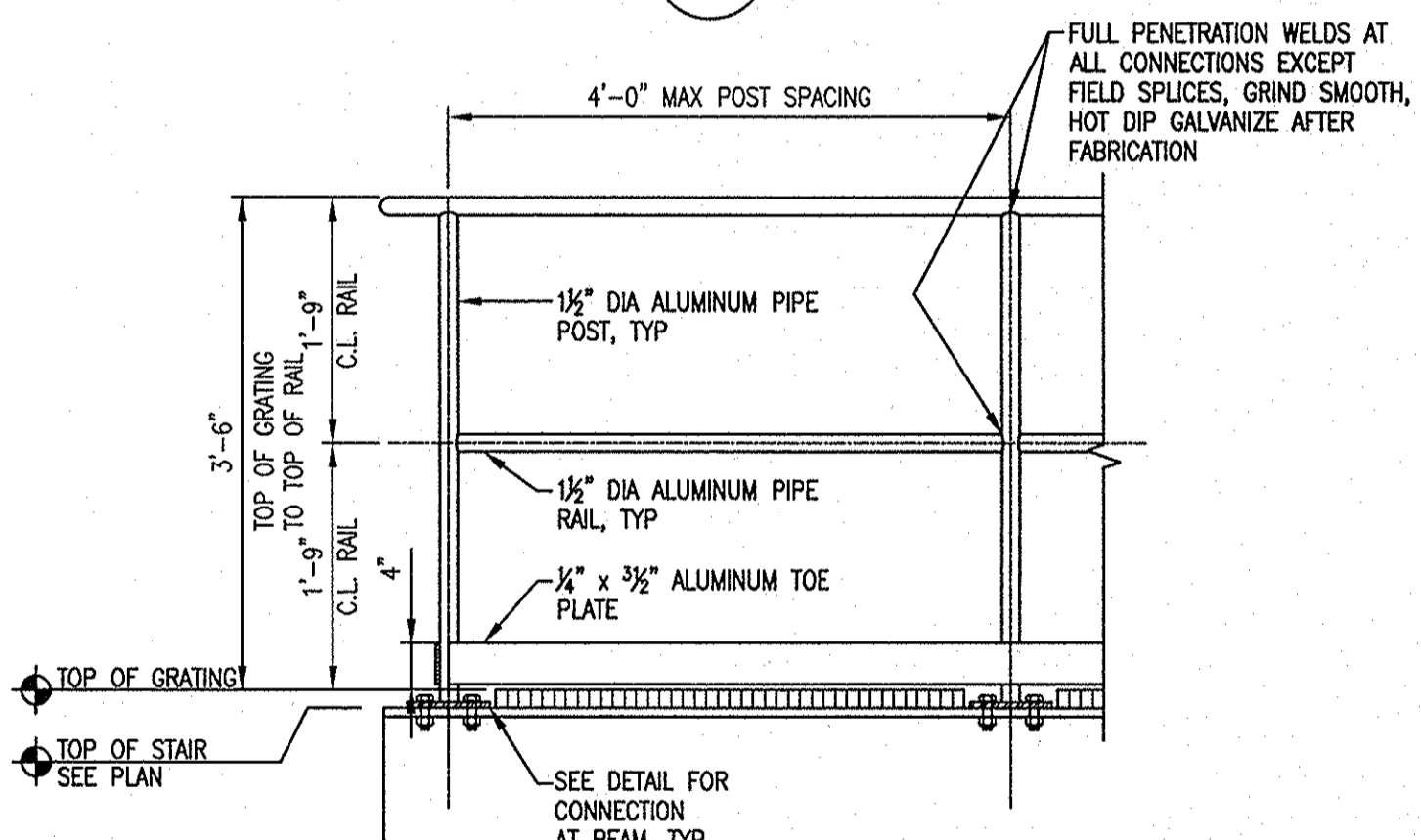
B COLUMN BASE
SCALE: 3/4"=1'-0"



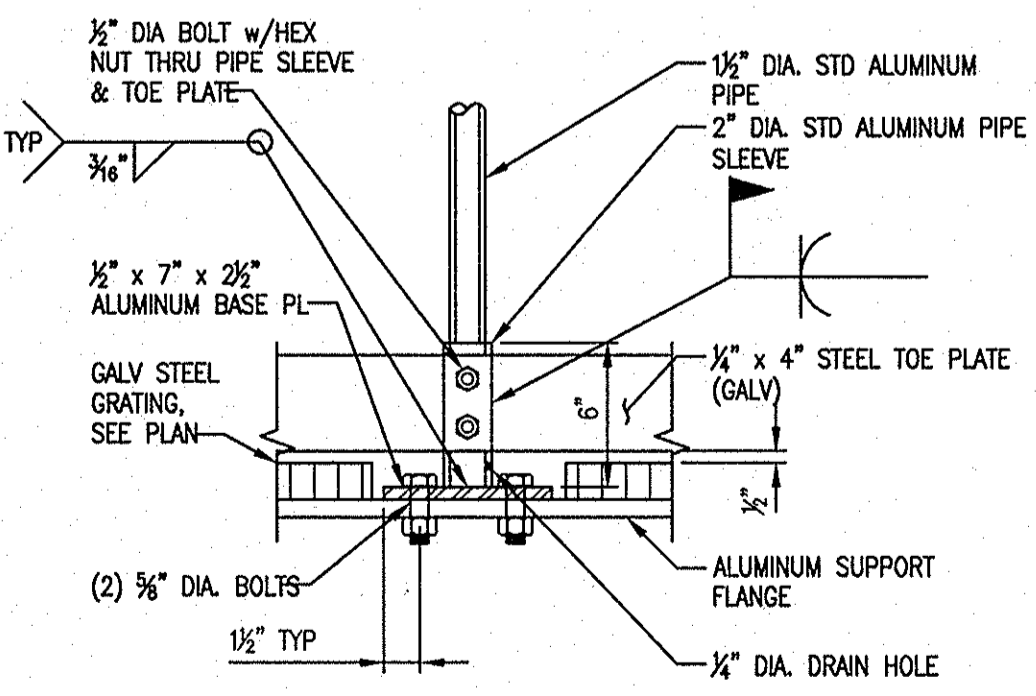
N TYPICAL LADDER CONNECTION
SCALE: 1 1/2"=1'-0"



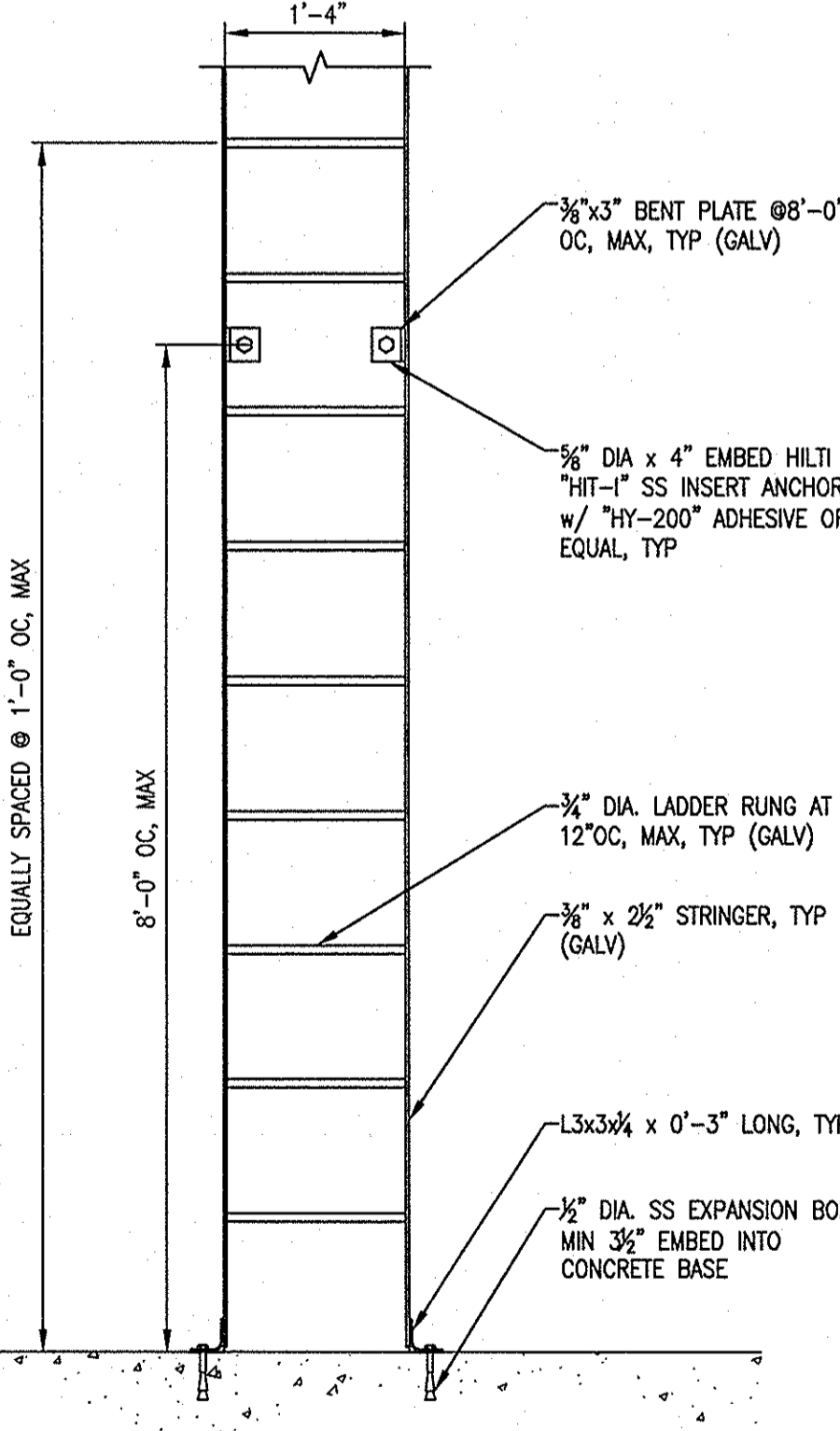
H TYPICAL STAIRWAY HANDRAIL
SCALE: 3/4"=1'-0"



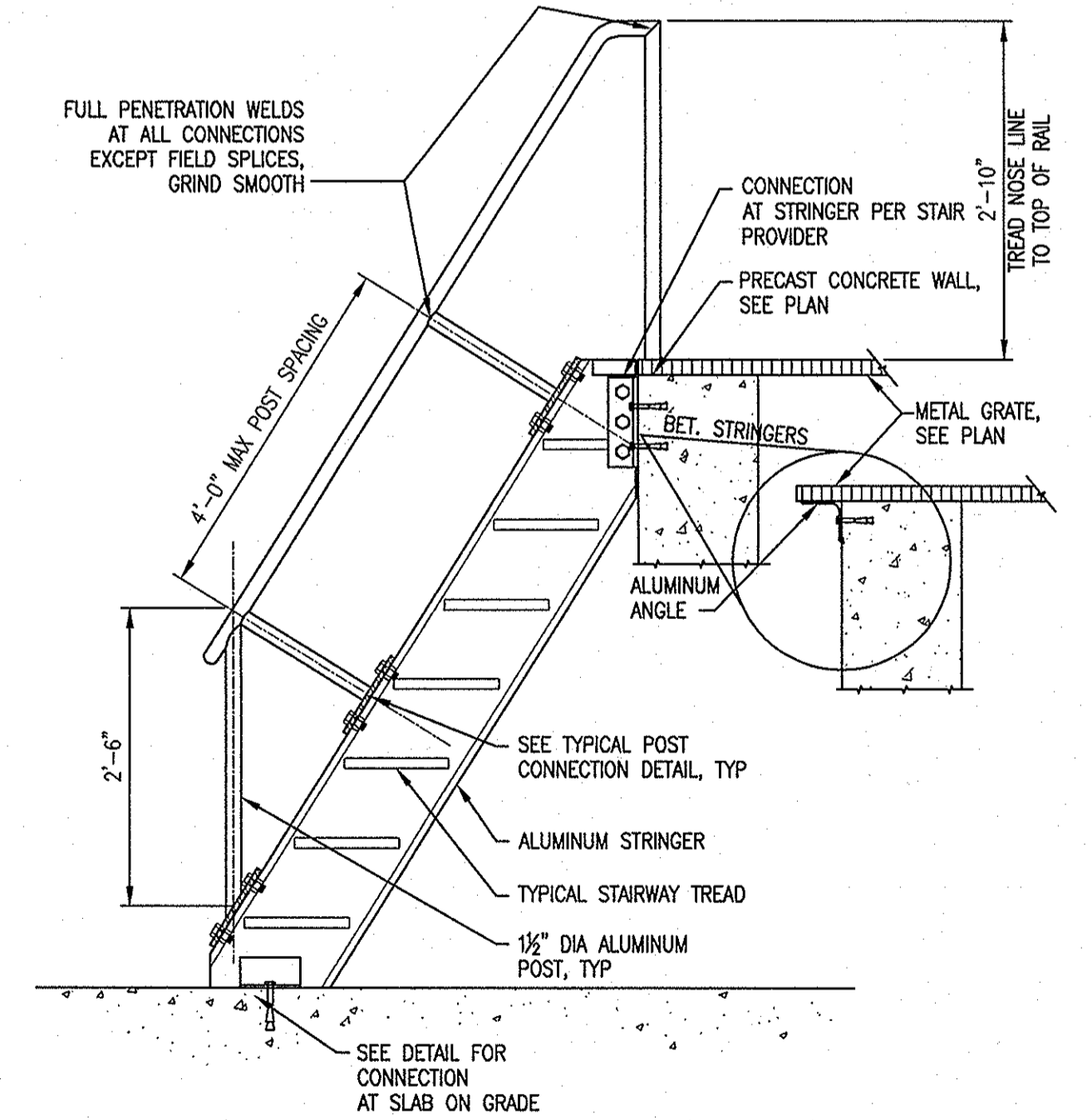
J TYPICAL HANDRAIL
SCALE: 3/4"=1'-0"



L TYPICAL REMOVABLE POST CONNECTION
SCALE: 1 1/2"=1'-0"



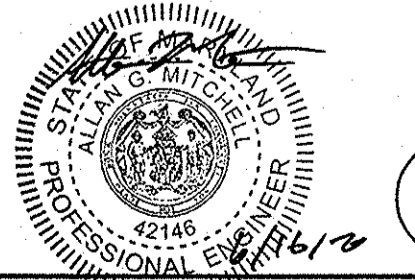
M TYPICAL LADDER ELEVATION
SCALE: 3/4"=1'-0"



P TYPICAL SHIP'S LADDER
SCALE: 3/4"=1'-0"

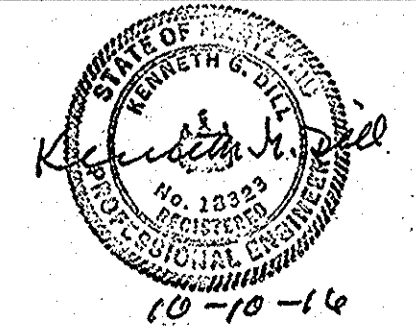
AS-BUILT
DATE 12/2021

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42146 EXPIRATION DATE: 12-15-2023



K TYPICAL POST CONNECTION AT STAIR
SCALE: 1 1/2"=1'-0"

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18323 EXPIRATION DATE: 07-05-2017



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James D. ... 2/7/21
DIRECTOR OF PUBLIC WORKS DATE

Thomas P. Butler 2/5/21
CHIEF, BUREAU OF ENGINEERING DATE

... 2/3/21
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES
ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

936 RINGBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE (410) 316-7800
FAX (410) 316-7818
WWW.KCI.COM

DES: NB				
DRN: PB				
CHK: LH				
DATE: AUG, 2016	AGM	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20	
	BY NO.	REVISION	DATE	

TYPICAL DETAILS

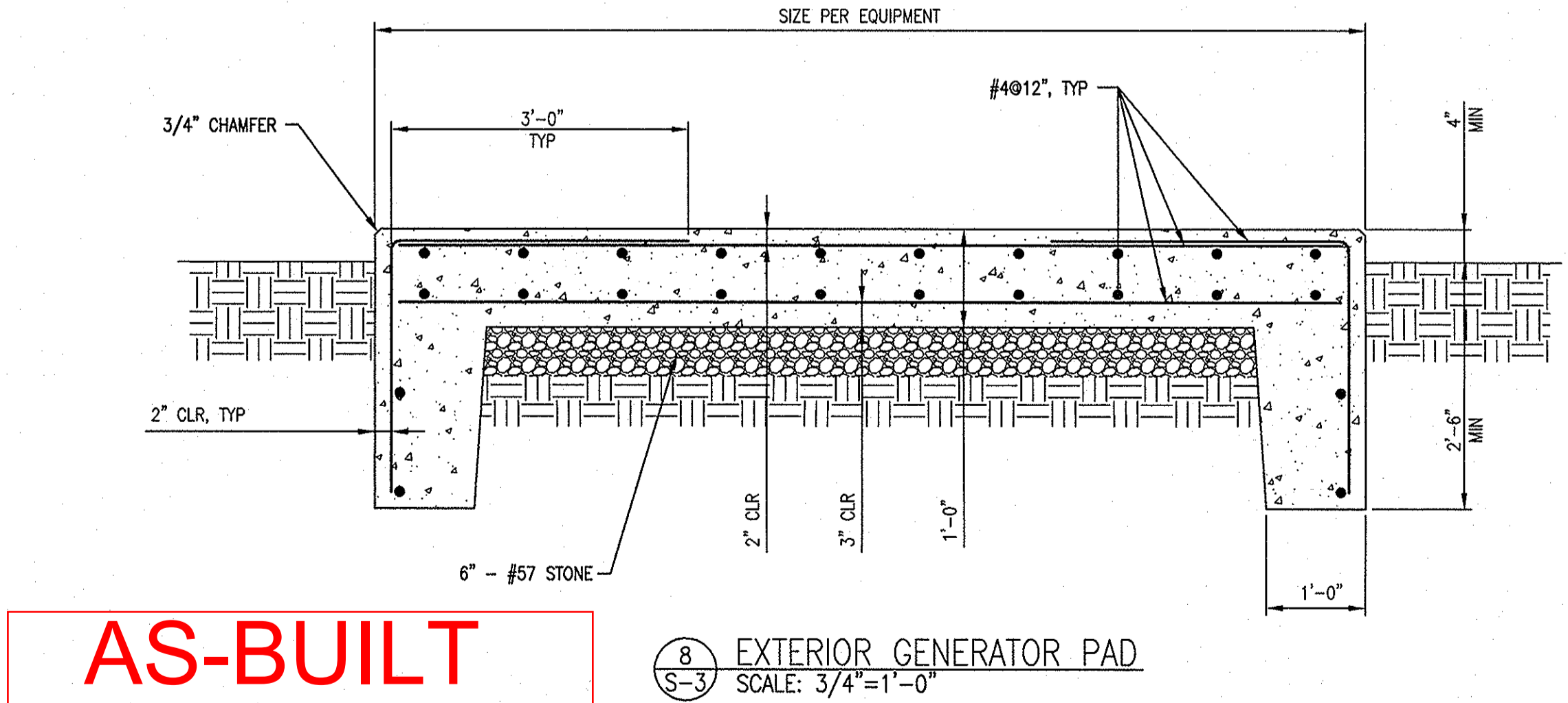
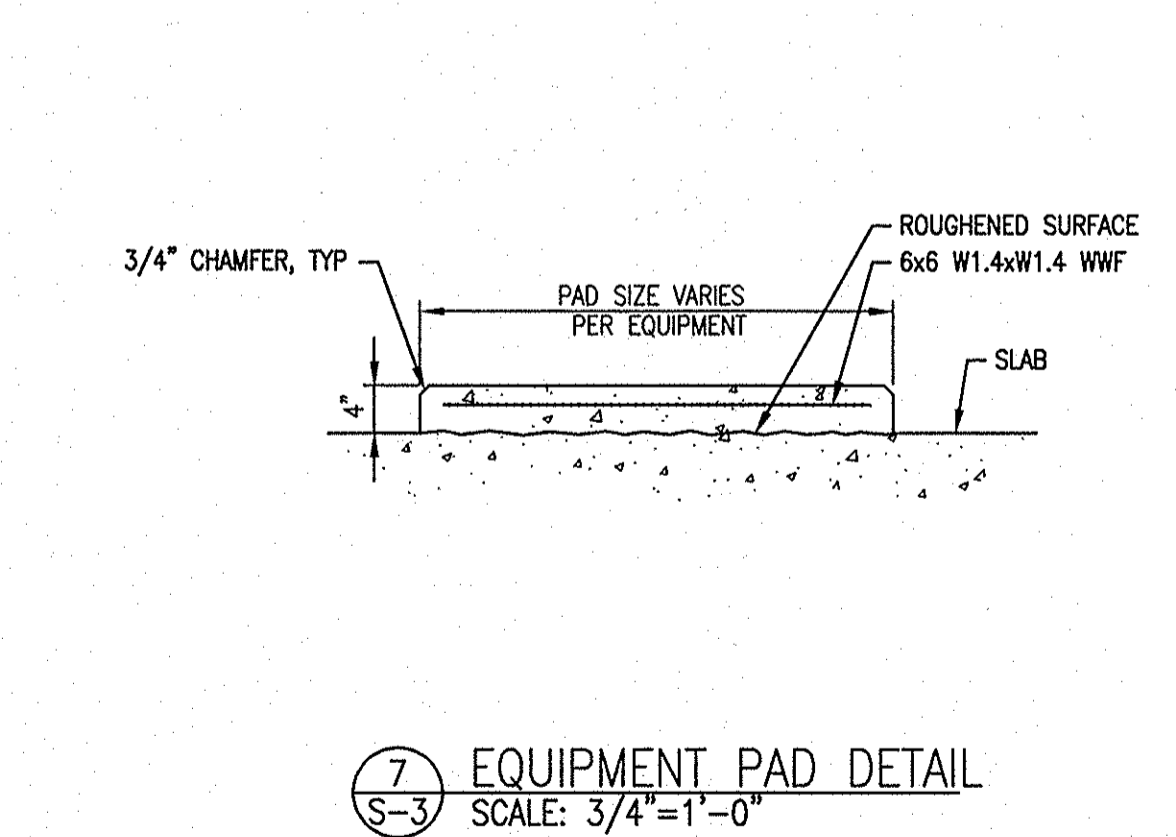
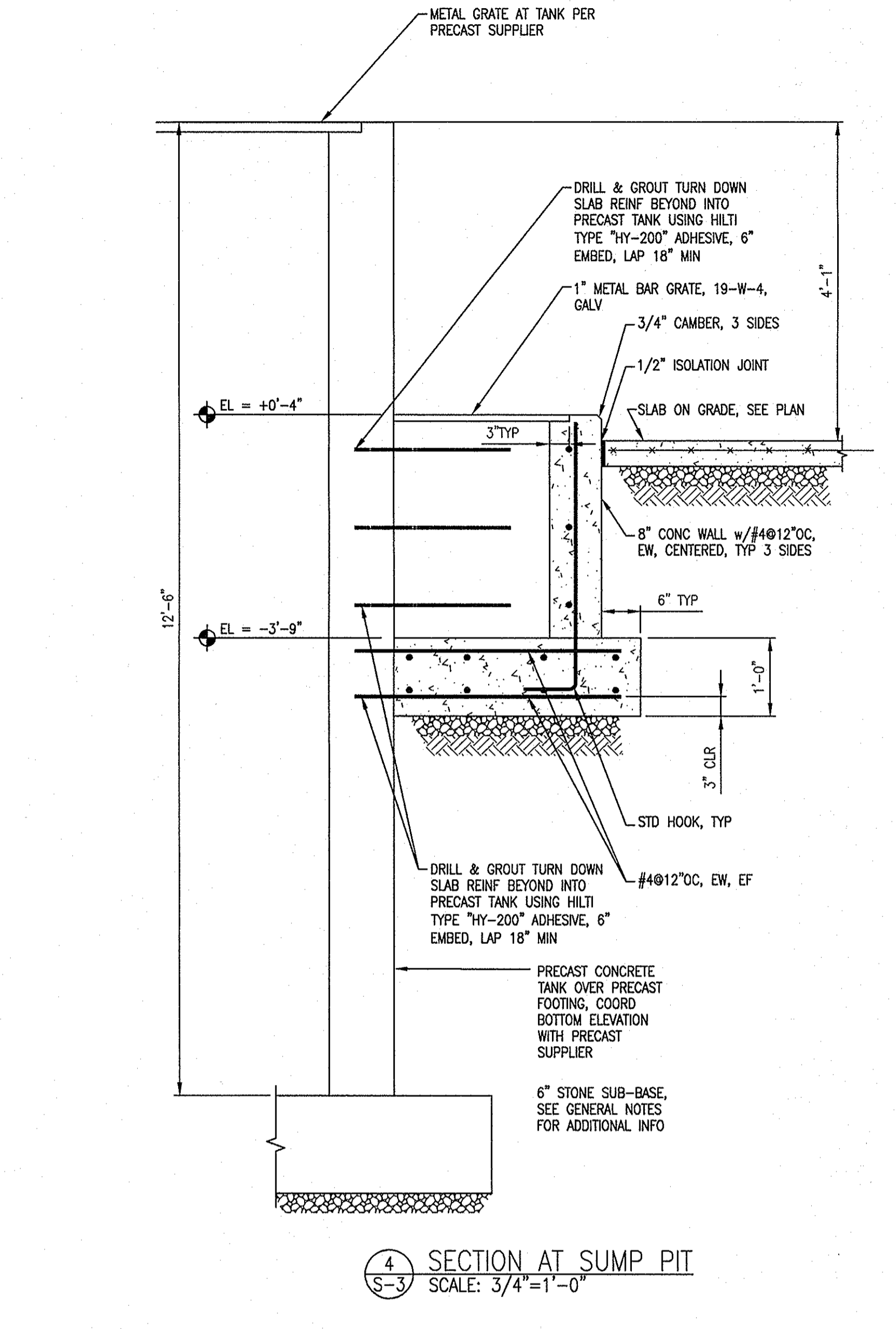
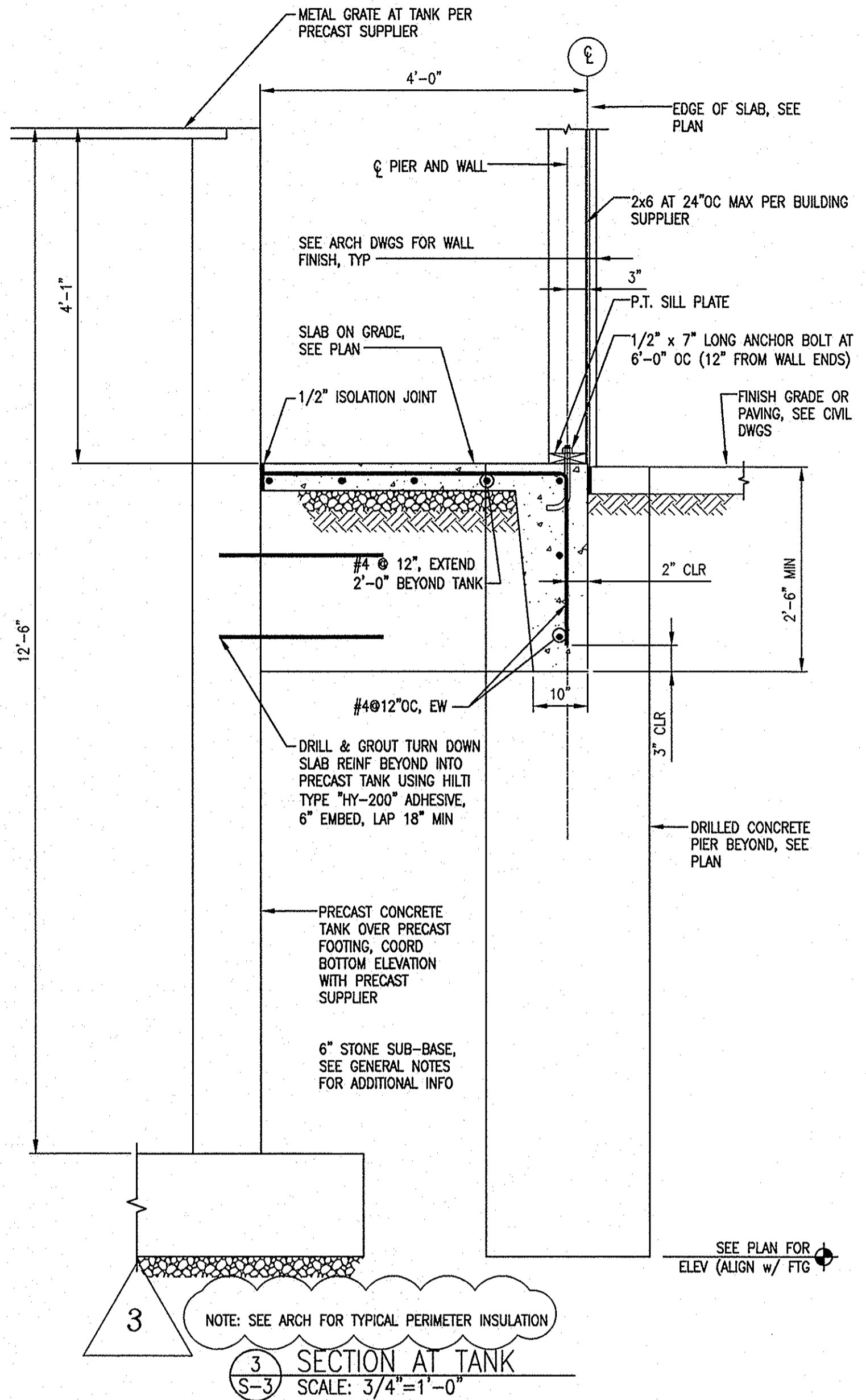
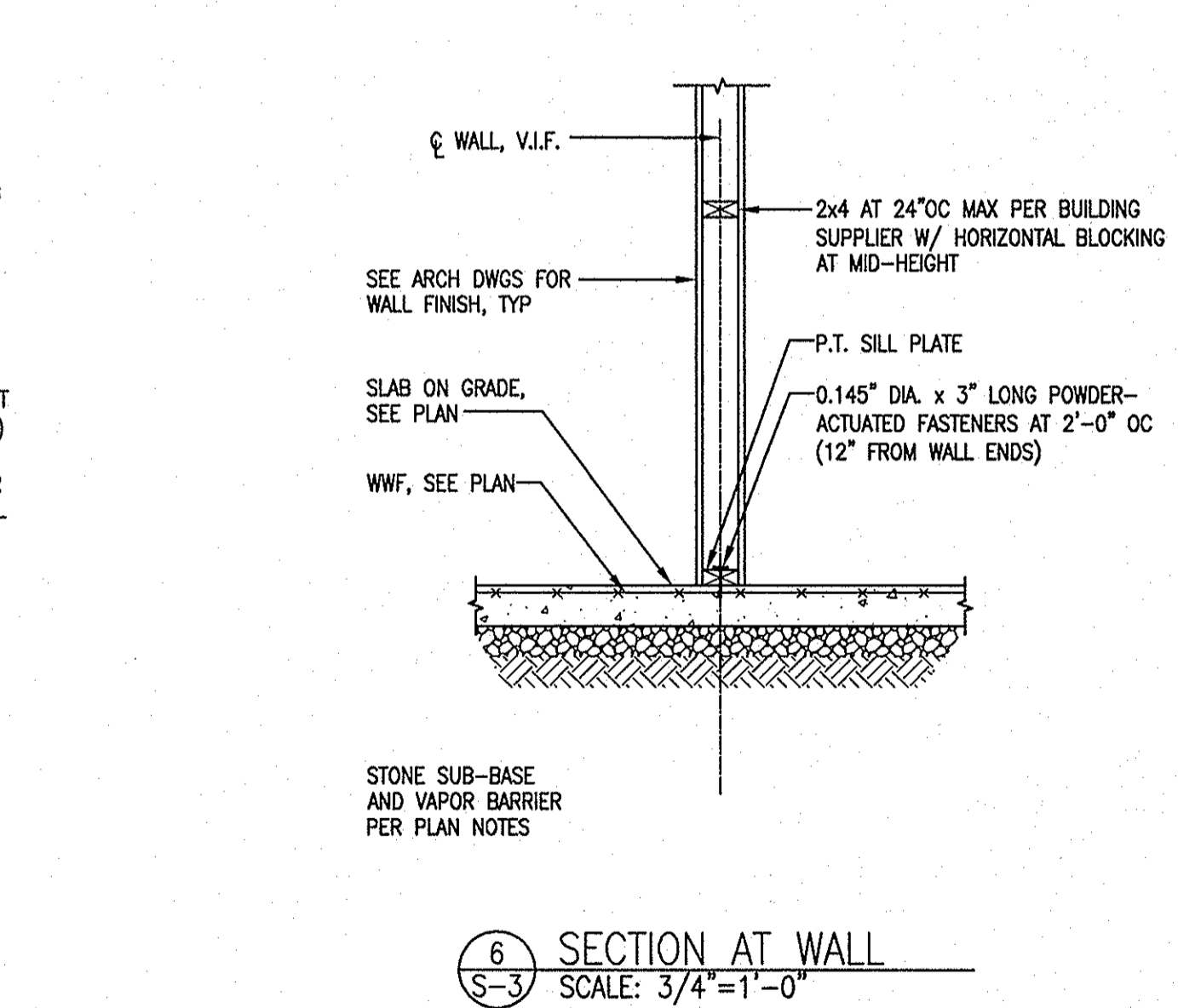
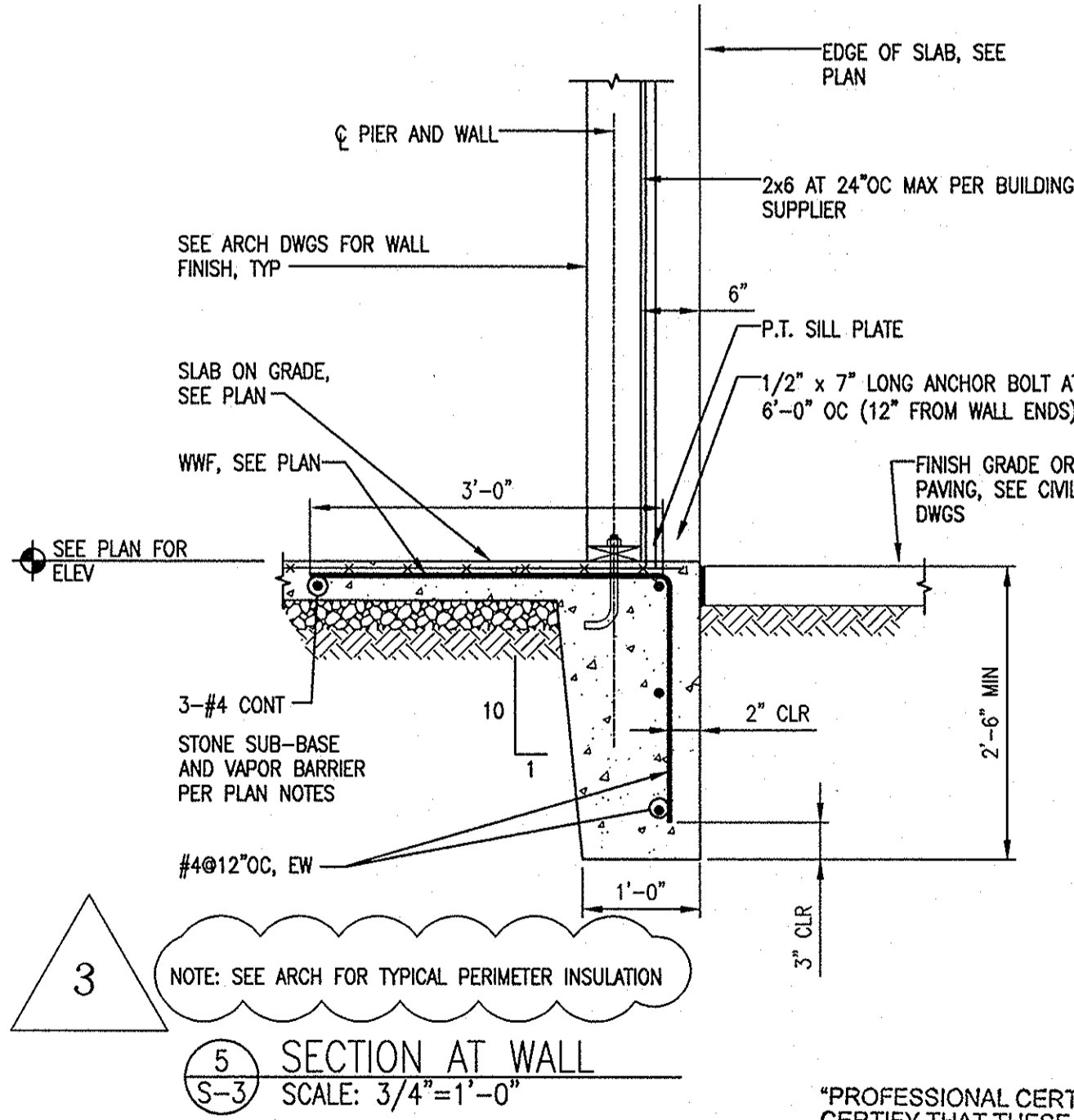
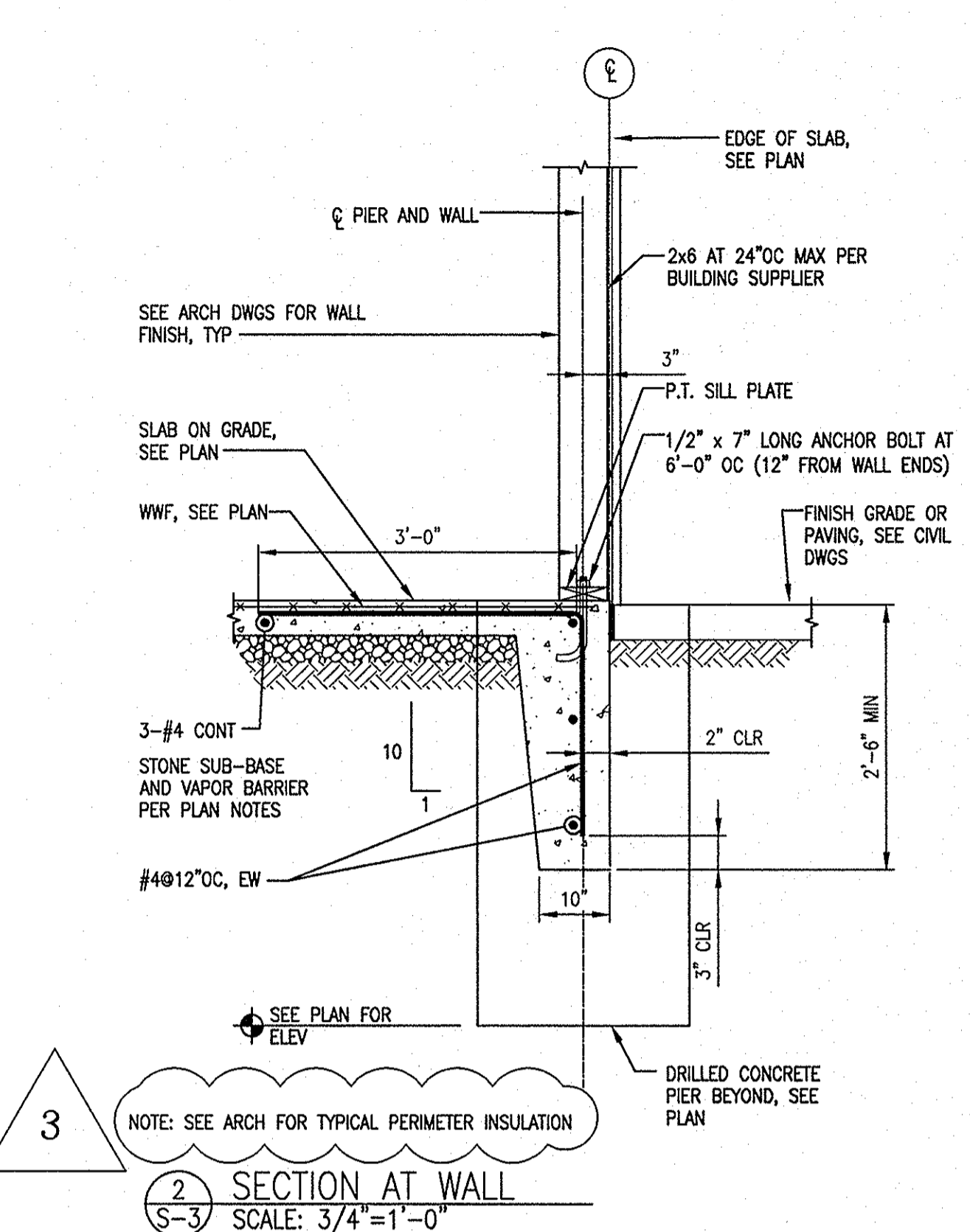
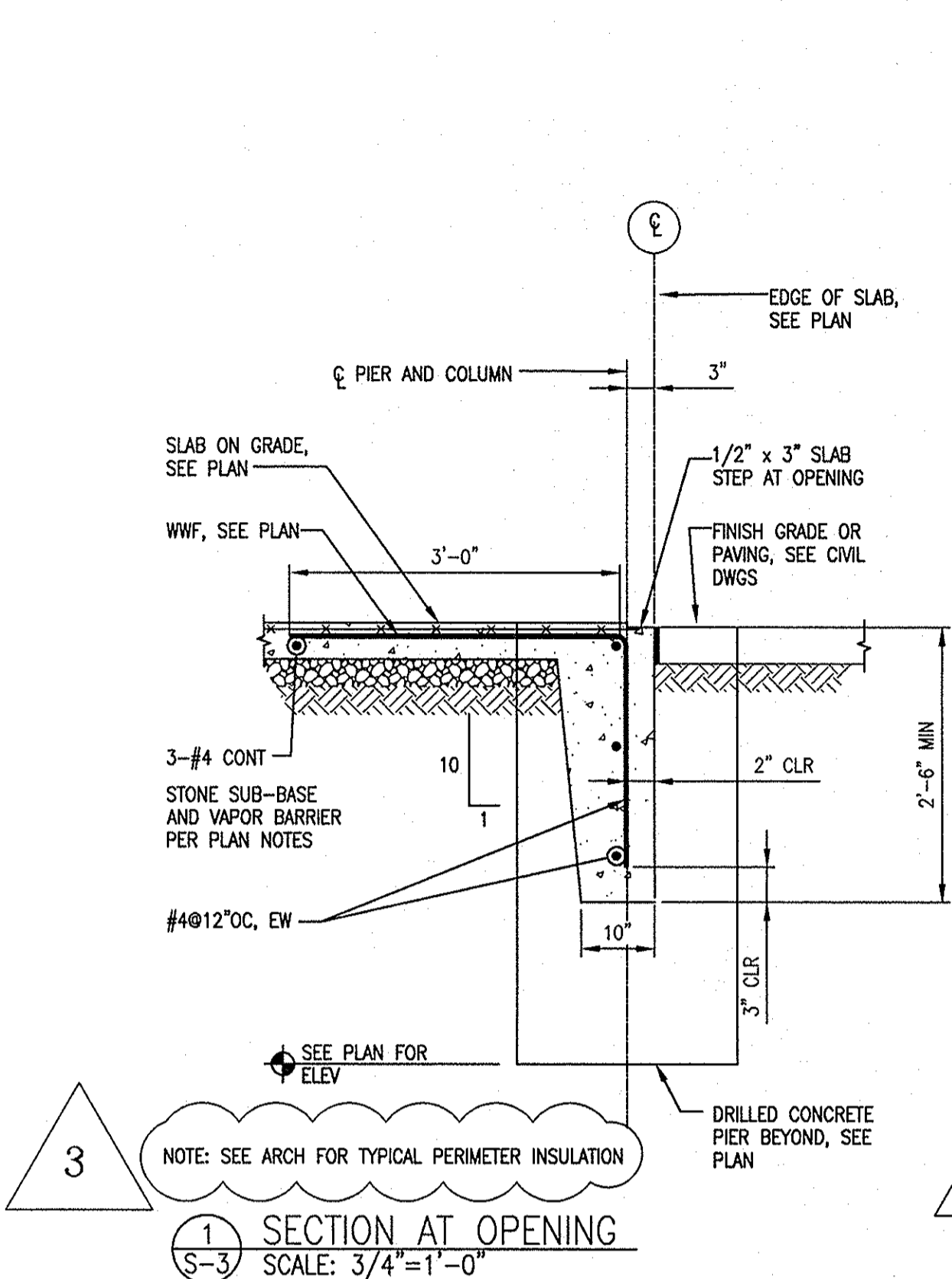
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

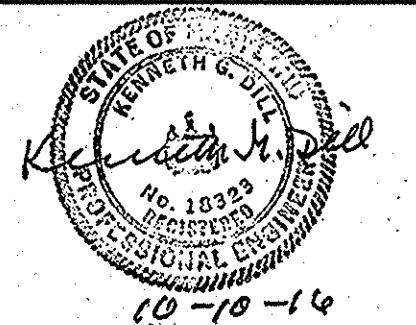
S-2
SCALE AS SHOWN
SHEET
15 OF 43



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 172146 EXPIRATION DATE: 17-15-2020



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 18323 EXPIRATION DATE: 07-05-2017



AS-BUILT
DATE 12/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John P. De... 2/1/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Suttler 2/3/17
CHIEF, BUREAU OF ENGINEERING DATE

... 1/25/16
CHIEF, BUREAU OF UTILITIES DATE

... 2/3/17
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI
TECHNOLOGIES

936 BUCKBRICK ROAD
STATEN, MARYLAND 21152
TEL: (410) 316-7800
FAX: (410) 316-7818
WWW.KCI.COM

DES: NB			
DRN: PB			
CHK: LH	KJ	AS-BUILT	11/21
DATE: AUG, 2016	AGM	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20
	BY NO.	REVISION	DATE

FOUNDATION SECTIONS

80' SCALE MAP NO. 40-41 BLOCK NO. 12

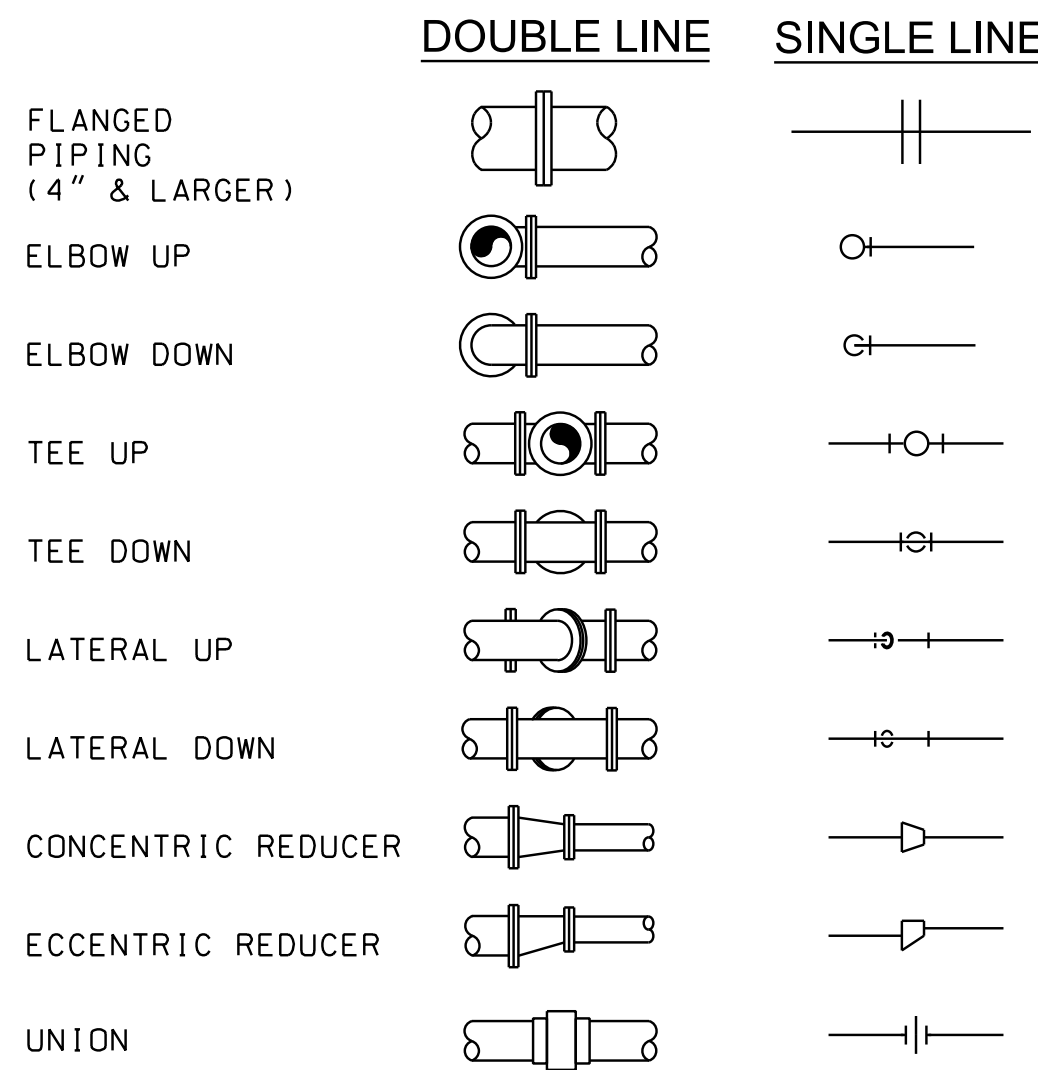
ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

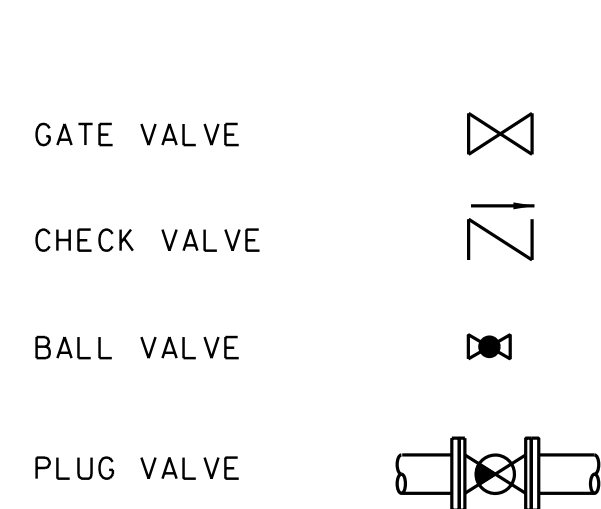
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

S-3
SCALE AS SHOWN
SHEET
16 OF 43

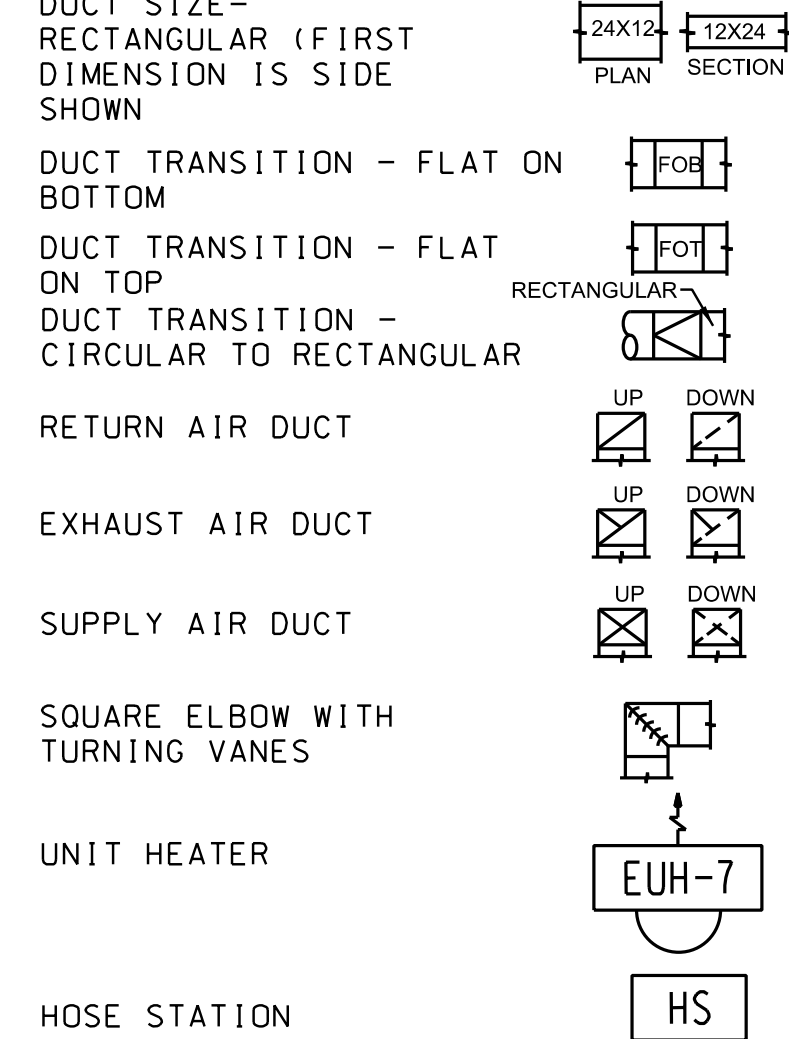
PROCESS PIPING SYMBOLS



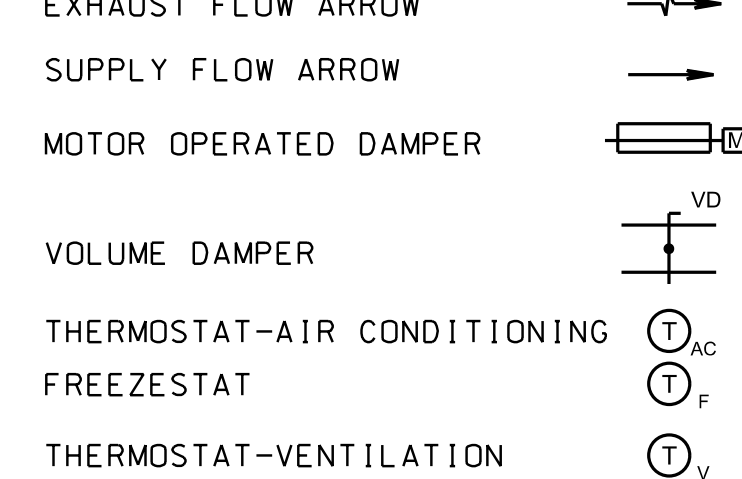
VALVE SYMBOLS



HVAC SYMBOLS

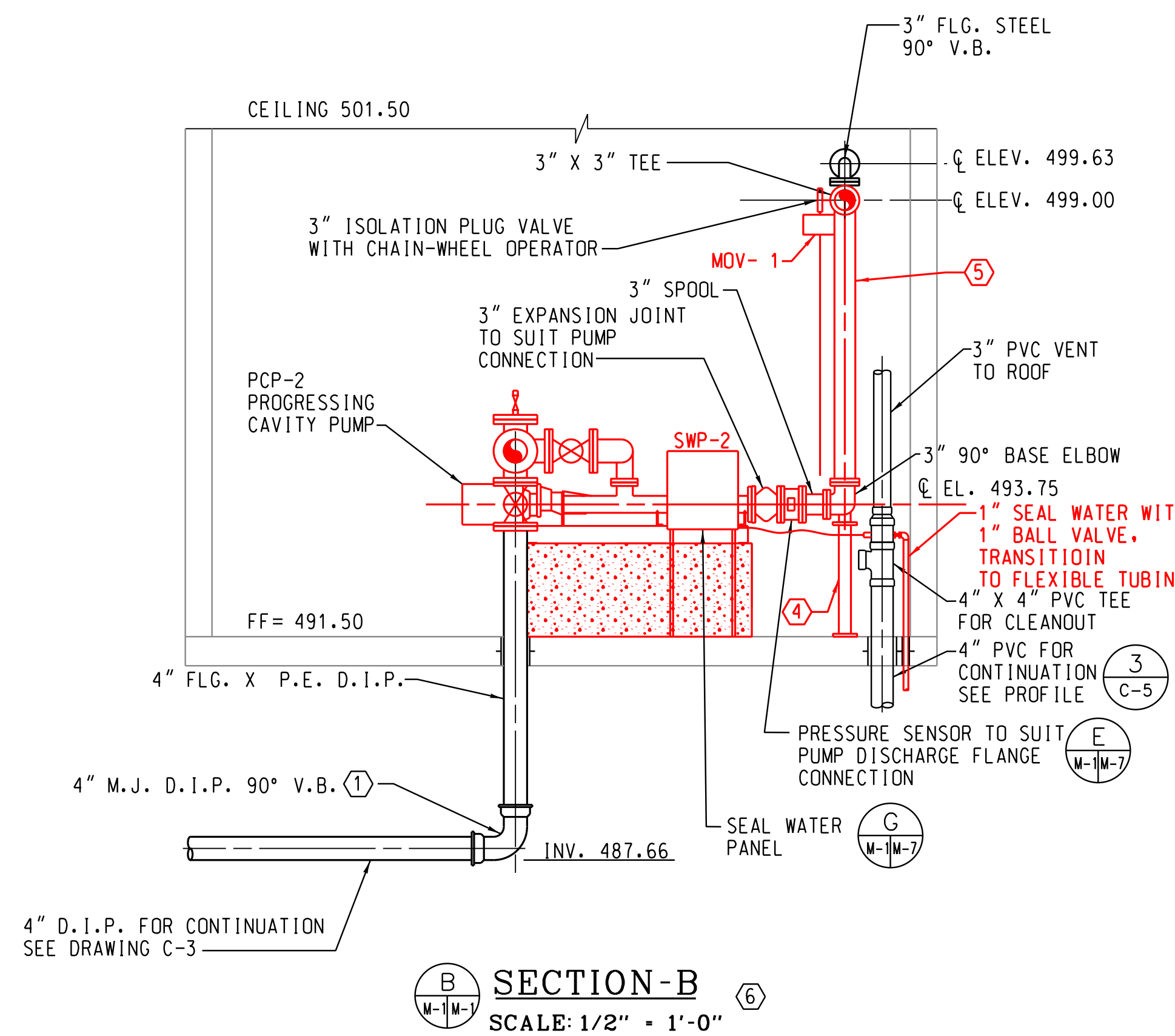
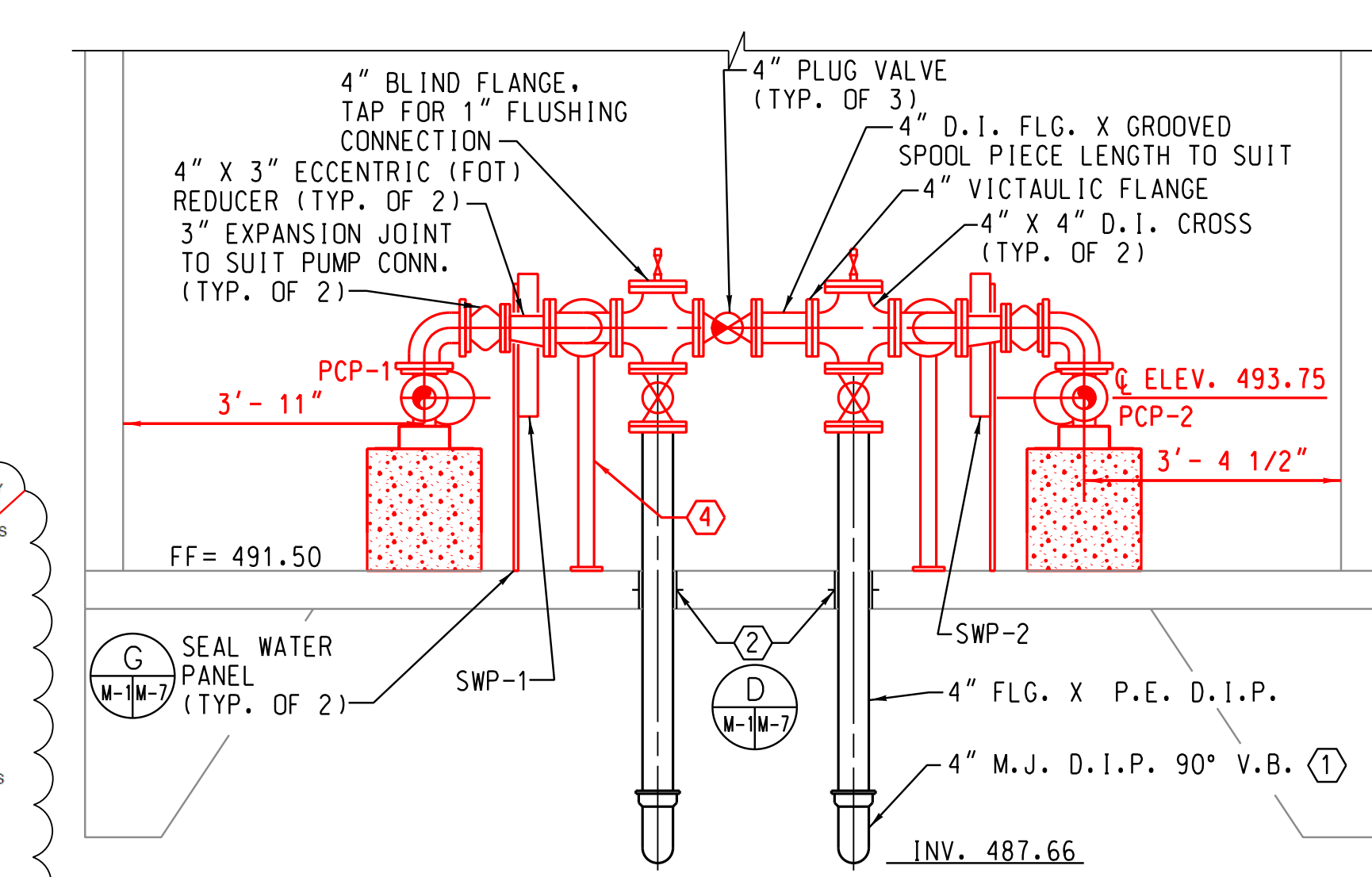
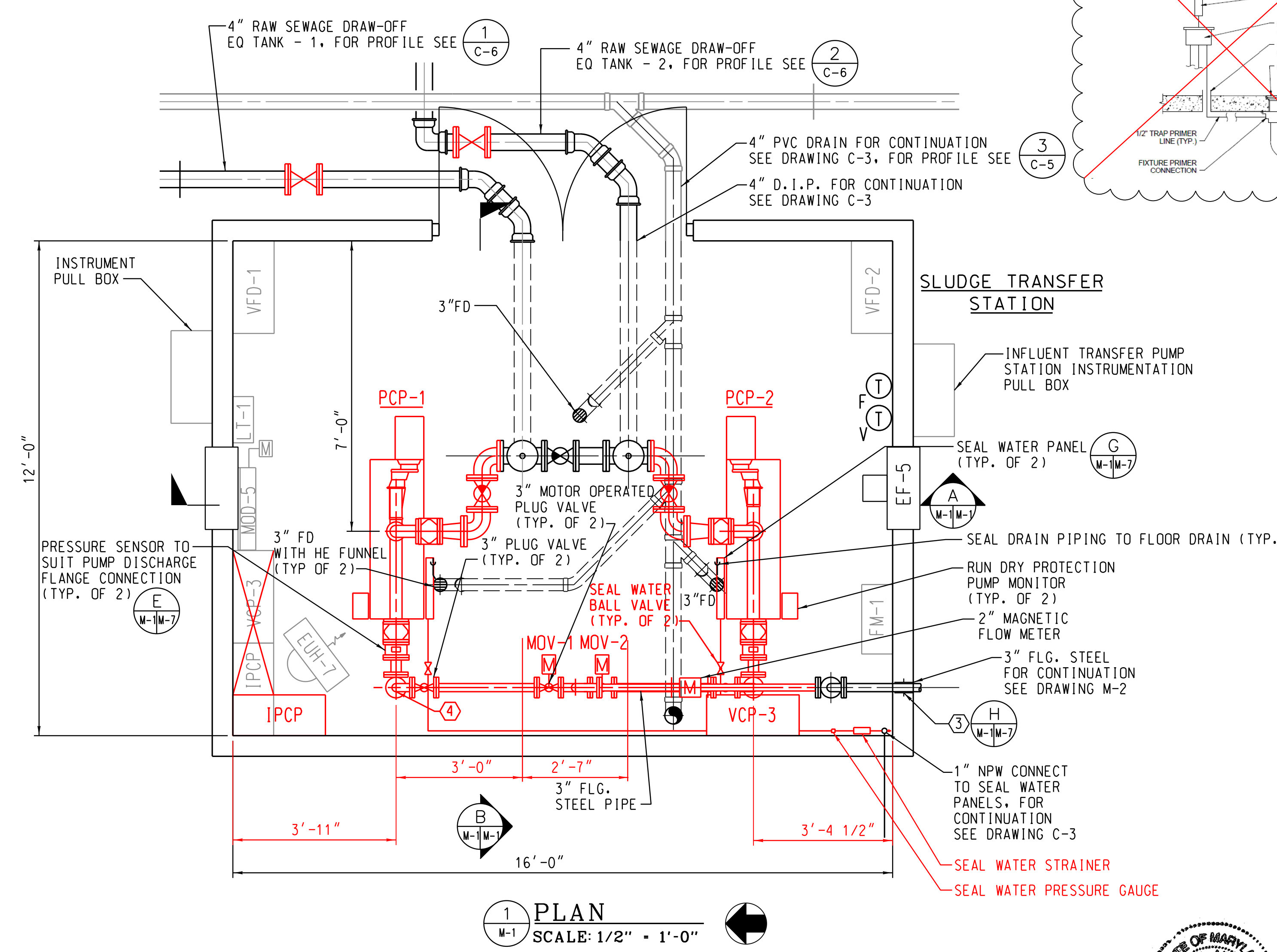


ABBREVIATIONS



GENERAL MECHANICAL NOTES

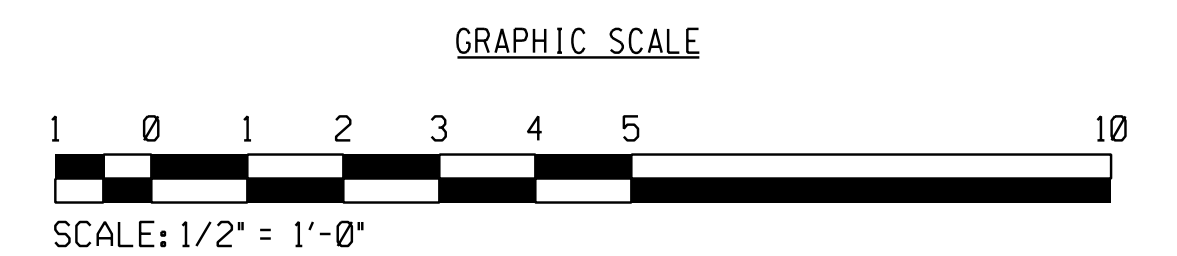
- THESE NOTES APPLY TO ALL MECHANICAL DRAWINGS
- UNLESS OTHERWISE NOTED, WALL PIPES AND SLEEVES SHALL HAVE A WATERSTOP COLLAR POSITIONED IN THE CENTER OF THE WALL OR FLOOR. SEE TYPICAL DETAILS FOR CONFIGURATION. WALL PIPES AND SLEEVES SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE POUR.
- PIPING SMALLER THAN 3" HAS BEEN SCHEMATICALLY SHOWN ON PLAN AND SECTION DRAWINGS. PROVIDE PIPE ROUTING AND ALL APPURTENANCES IN ACCORDANCE WITH RESPECTIVE SCHEMATICS. PROVIDE ALL NECESSARY FITTINGS TO MAKE CONNECTIONS. UNIONS, BUSHING AND/OR REDUCING INSERTS, ETC. NOT SHOWN ON DRAWINGS BUT REQUIRED FOR INSTALLATION SHALL BE FURNISHED AND INSTALLED.
- SCHEMATIC DRAWINGS SHOW PROCESS CONNECTIONS AND NOT SPATIAL ORIENTATION.
- THE SIZE OF THE PIPE CONNECTIONS AT THE PROCESS EQUIPMENT ARE SHOWN TO DEMONSTRATE INTENT. SIZES MAY VARY FROM WHAT IS SHOWN. COORDINATE THE SIZE OF CONNECTIONS TO ALL APPROVED PROCESS EQUIPMENT.
- SIZE OF FITTINGS SHOWN SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED.
- UNLESS OTHERWISE NOTED, MINIMUM SLOPE FOR DRAINS SHALL BE 1/4 INCH PER LINEAR FOOT.
- VALVES ARE NORMALLY OPEN (N.O.) UNLESS NOTED AS NORMALLY CLOSED (N.C.).
- COORDINATE THE LOCATION OF VALVE SUPPORTS SO THAT ACCESS TO VALVE BEARINGS IS NOT RESTRICTED.



EQUIPMENT NAMES

EF-X	EXHAUST FAN
EUH-X	ELECTRIC UNIT HEATER
IPCP	INFLUENT PUMP CONTROL PANEL
MOD-X	MOTOR OPERATED DAMPER
MOV-X	MOTOR OPERATED VALVE
PCP-X	PROGRESSING CAVITY PUMP
VFD-X	VARIABLE FREQUENCY DRIVE
VCP	VENTILATION CONTROL PANEL
SWP-X	SEAL WATER PANEL

- CONSTRUCTION NOTES**
- ALL BURIED M.J. PIPING JOINTS SHALL BE RESTRAINED.
 - SLEEVE FLOOR, GROUT AND MAKE WATERTIGHT.
 - SLEEVE WALL TO SUIT PIPE PENETRATION, SEAL AND MAKE WATERTIGHT WITH MECHANICAL SEAL.
 - TYPICAL PIPE SUPPORT SHALL BE AN ADJUSTABLE PIPE STANCHION OR CONCRETE PIER TO SUIT HEIGHT REQUIREMENTS.
 - PROVIDE FLOOR MOUNTED STYLE PIPE SUPPORT.
 - NOT ALL PLUMBING AND HVAC SHOWN FOR CLARITY.



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33925, EXPIRATION DATE: 01/15/2021



PLOTTED: 10:09 AM on Tuesday, December 14, 2021
BY: Kevin Jackson
FILE: M:\2007\00071378_05\Drawings\007137806_M-001 Sludge Trans.dgn

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Kevin Jackson 2/6/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Butler 2/6/17
CHIEF, BUREAU OF ENGINEERING DATE

John C. ... 11/25/10
CHIEF, BUREAU OF UTILITIES DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES

936 RIDGEBROOK ROAD
SPRINGSBORO, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
WWW.KCI.COM

STATE OF MARYLAND
ENGINEER
KEVIN E. JACKSON
LICENSE NO. 33925
EXPIRES 01/15/2021
PROFESSIONAL ENGINEER

DES:	KFJ			
DRN:	KFJ			
CHK:	SEA	KJ	AS-BUILT	12/21
DATE:	NOVEMBER 21, 2018			
AUG. 2016				
BY:	NO.			
NOVEMBER 21, 2018				

INFLUENT TRANSFER STATION
PLAN AND SECTIONS

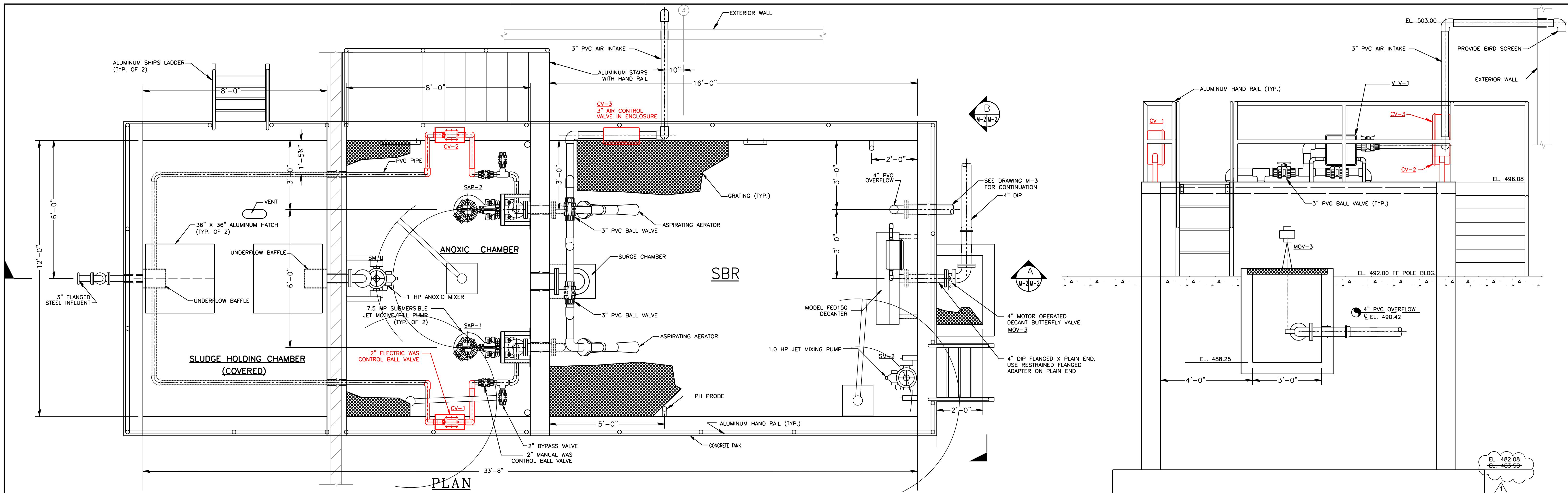
600' SCALE MAP NO. 40-41 BLOCK NO. 12

AS-BUILT REPLACEMENT SHEET 12/2021

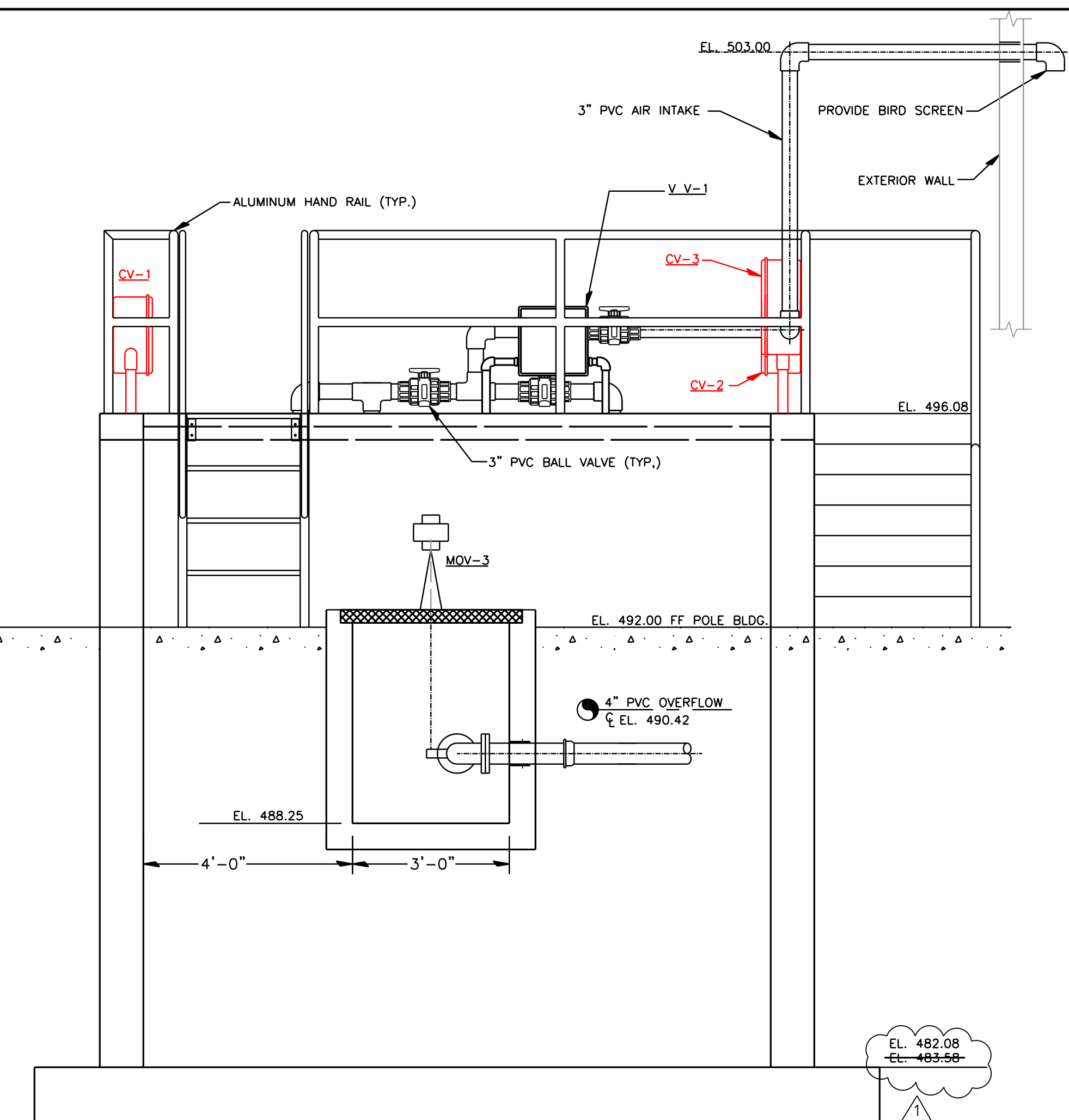
ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

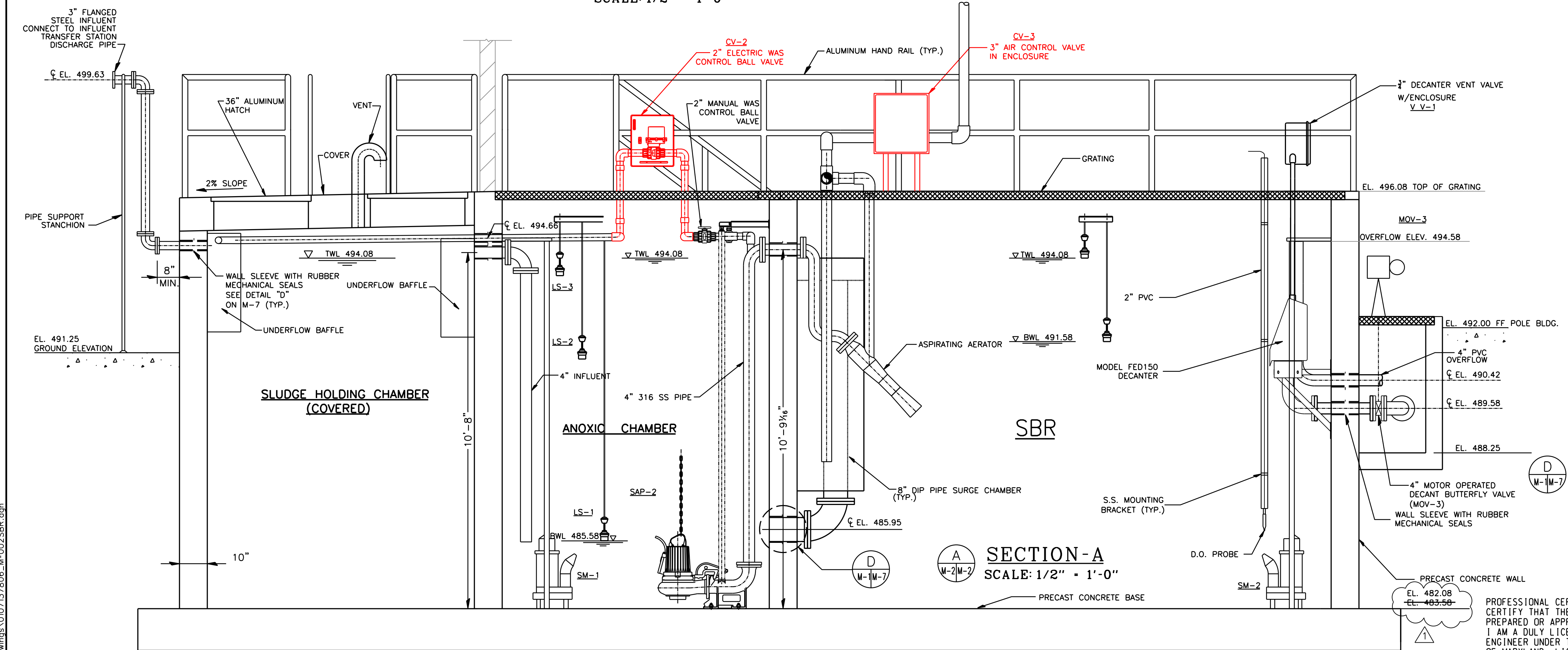
SCALE AS SHOWN
SHEET 12 OF 43



PLAN
SCALE: 1/2" = 1'-0"

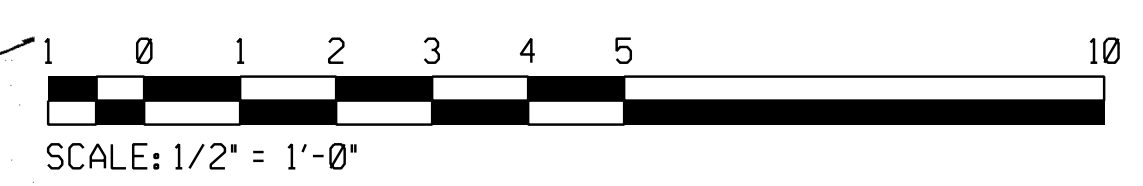
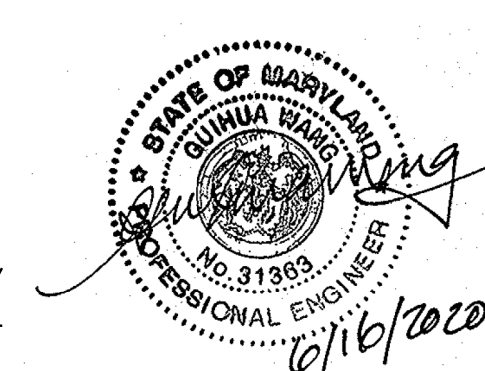


SECTION-B
SCALE: 1/2" = 1'-0"



SECTION-A
SCALE: 1/2" = 1'-0"

- NOTE:
1. SEE HIGH PERFORMANCE COATING SPECIFICATION FOR THE COATING REQUIREMENT FOR THE SLUDGE HOLDING CHAMBER.
 2. COORDINATE DAVIT CRANE LOCATIONS TO SUIT EQUIPMENT REMOVAL LOCATIONS.
 3. COORDINATE WITH WOOD POST FRAME BUILDING MANUFACTURER FOR PIPE PENETRATIONS AT THE BUILDING.



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 31363, EXPIRATION DATE: 01/16/2022.

AS-BUILT REPLACEMENT SHEET 12/2021 M-2

PLOTTED: 01:53 PM on Friday, December 10, 2021
BY: Kevin Jackson
FILE: M-2007.00071378.05.Dwg\m-2\12/2021.M-002SBR.dgn

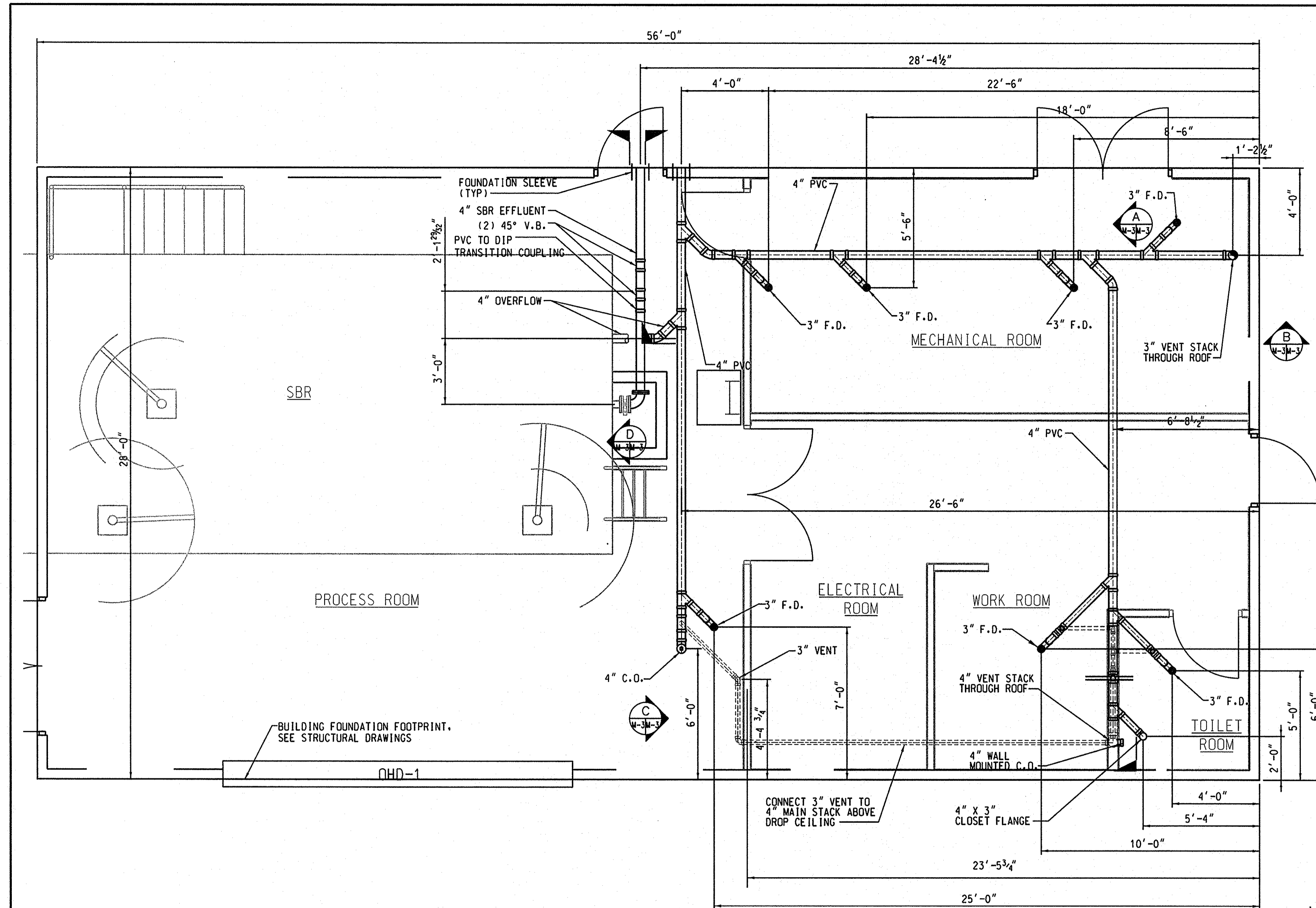
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS 936 RINGBERG ROAD SPARKS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com	
Director of Public Works <i>Kevin Jackson</i> DATE: 11/25/20	Chief, Bureau of Utilities <i>Thomas E. Butler</i> DATE: 12/17	Chief, Utility Design Division <i>Thomas E. Butler</i> DATE: 12/17	PROFESSIONAL ENGINEER STATE OF MARYLAND License No. 31363 10/10/2016

DES: KFJ					
DRN: KFJ					
CHK: GW	KJ	AS-BUILT	12/21		
DATE: AUG. 2016	BY: NO.	NOVEMBER 21, 2018			
		REVISION	DATE	600'	SCALE MAP NO. 40-41 BLOCK NO. 12

SEQUENCING BATCH REACTOR

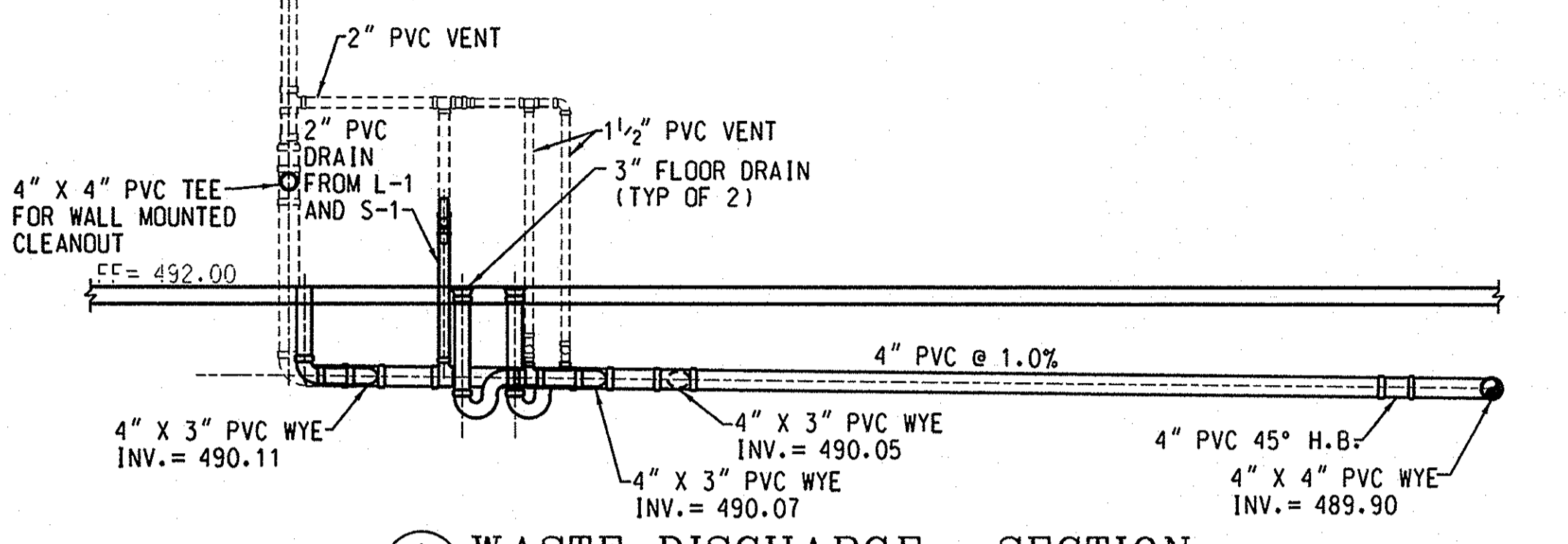
ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 18 OF 43

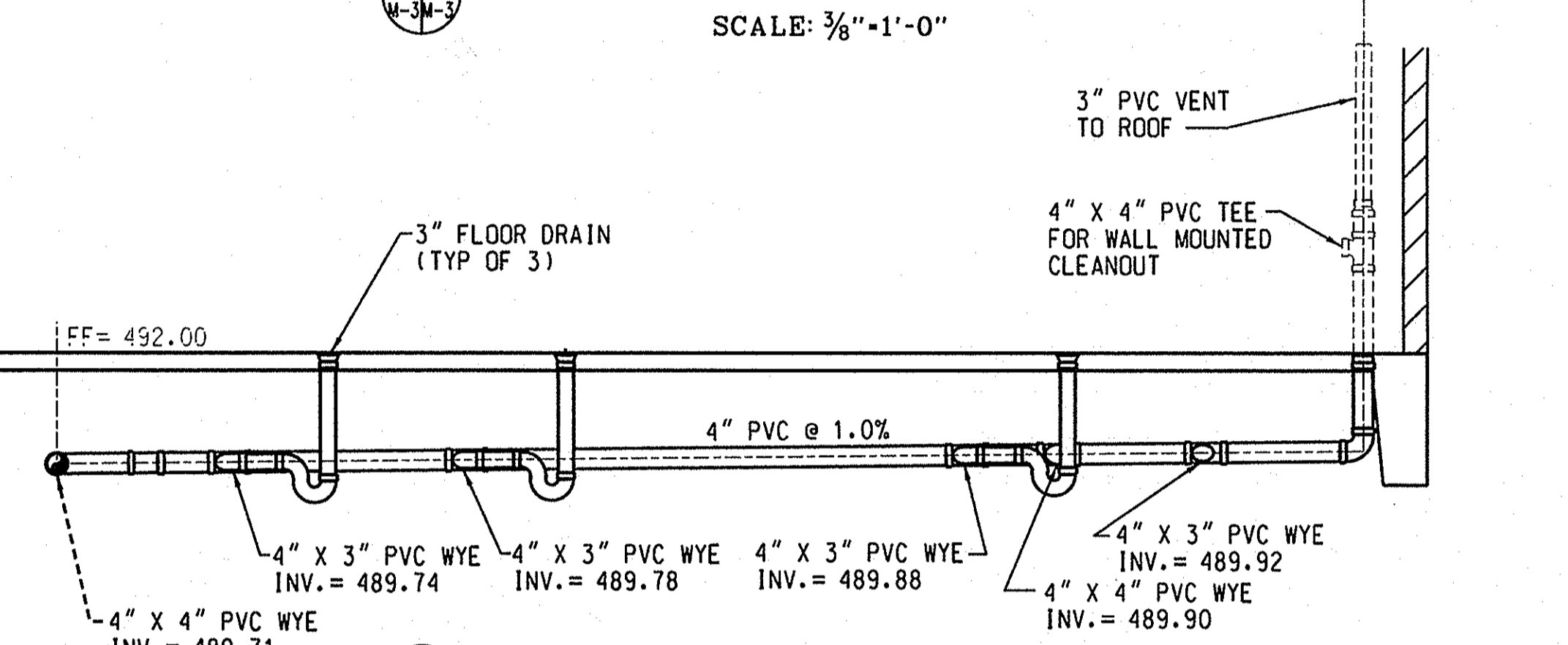


1 WASTE DISCHARGE - PLAN
SCALE: 3/8"=1'-0"

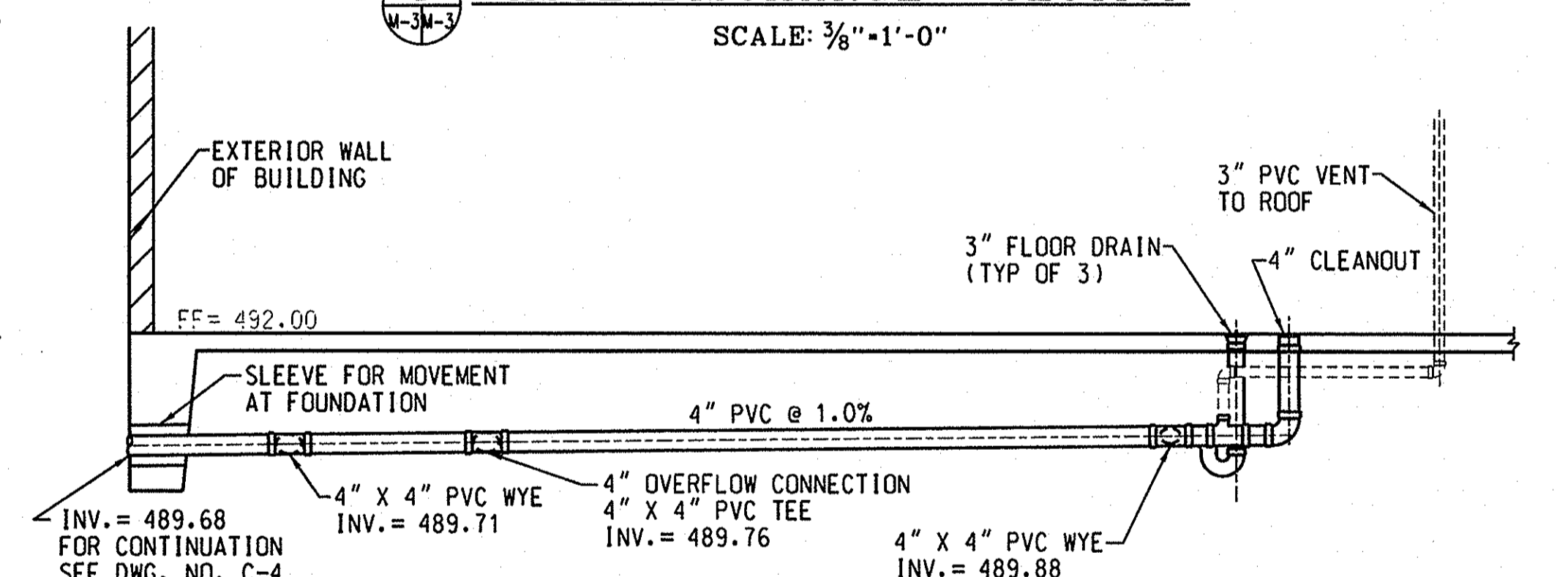
GENERAL SHEET NOTES
1. PROVIDE TRAP PRIMING SYSTEM FOR ALL FLOOR DRAINS. MOUNT (1) PRIMING VALVE IN MECHANICAL ROOM AND (1) PRIMING VALVE IN TOILET ROOM. PRIMING PIPING NOT SHOWN FOR CLARITY. ROUTE PIPING PRIOR TO SLAB POUR. REFER TO THE DETAIL ON M-2.



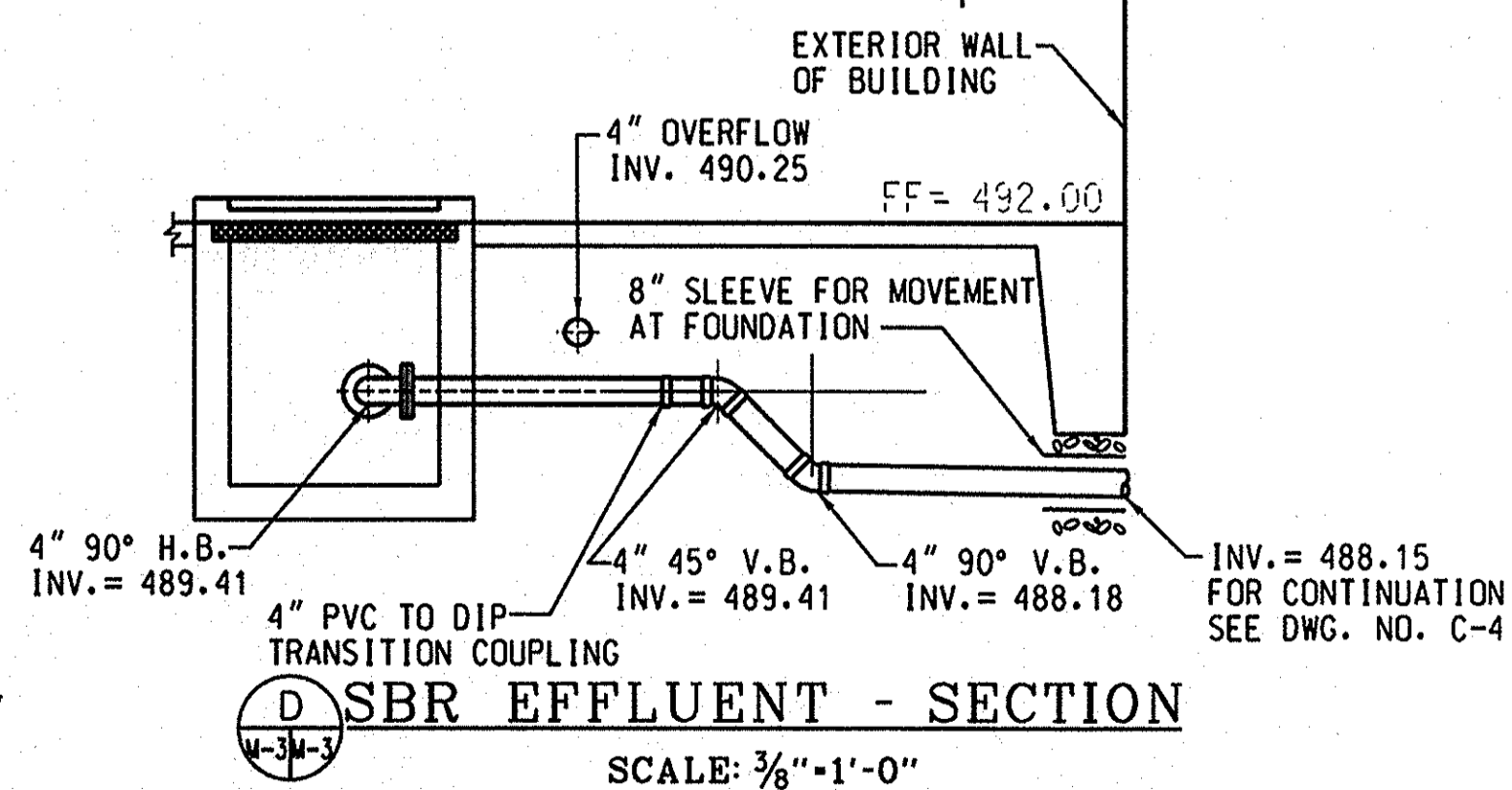
A WASTE DISCHARGE - SECTION
SCALE: 3/8"=1'-0"



B WASTE DISCHARGE - SECTION
SCALE: 3/8"=1'-0"



C WASTE DISCHARGE - SECTION
SCALE: 3/8"=1'-0"



D SBR EFFLUENT - SECTION
SCALE: 3/8"=1'-0"

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 33925 EXPIRATION DATE: 01/15/2021



6/16/20



AS-BUILT
DATE 12/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James S. Kautler 2/5/17
DIRECTOR OF PUBLIC WORKS
DATE

Thomas E. Kautler 2/5/17
CHIEF, BUREAU OF ENGINEERING
DATE

Thomas E. Kautler 11/25/10
CHIEF, UTILITY DESIGN DIVISION
DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI
TECHNOLOGIES

936 RIDGEBROOK ROAD
SHIRAZ, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
WWW.KCI.COM

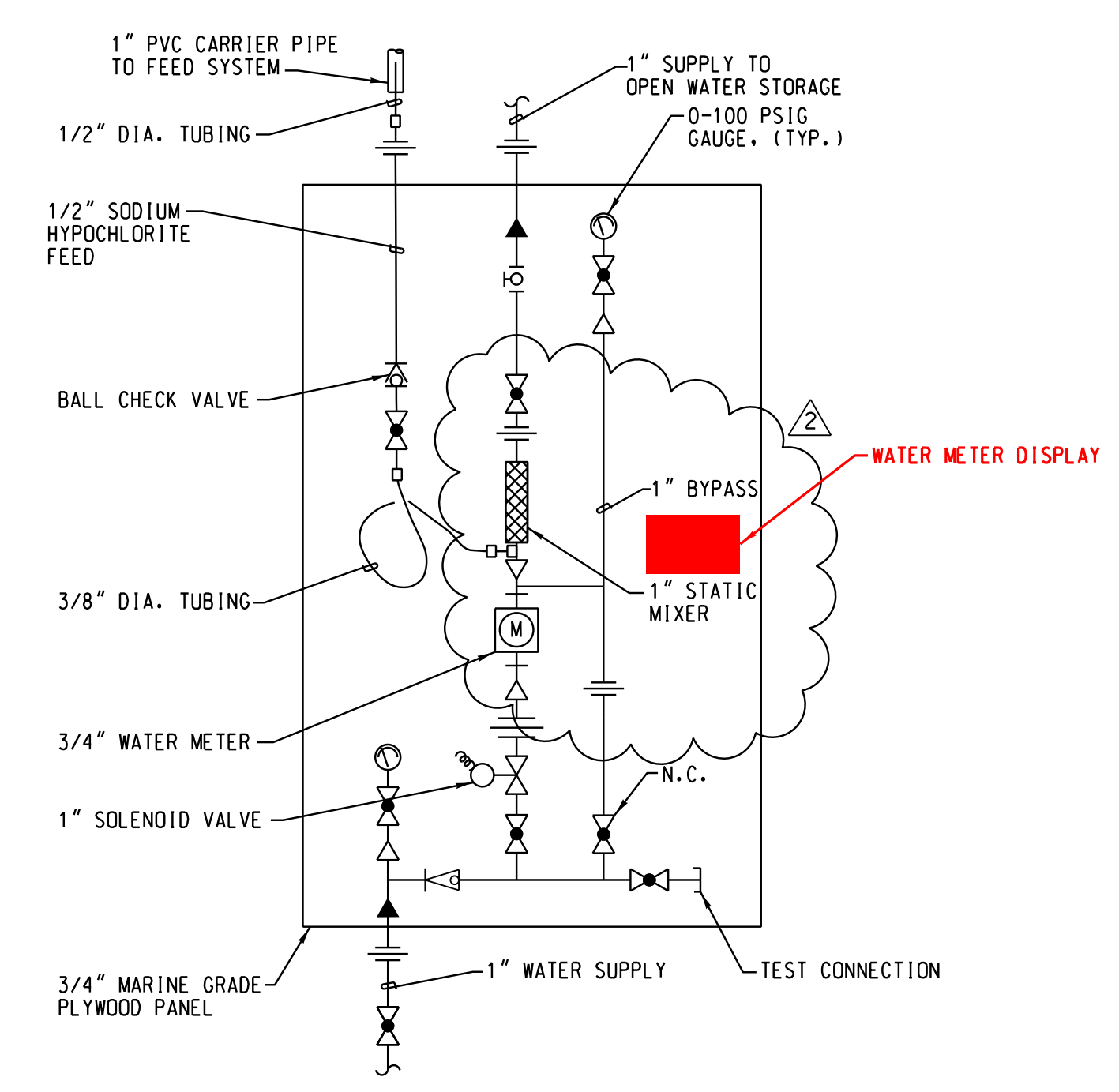
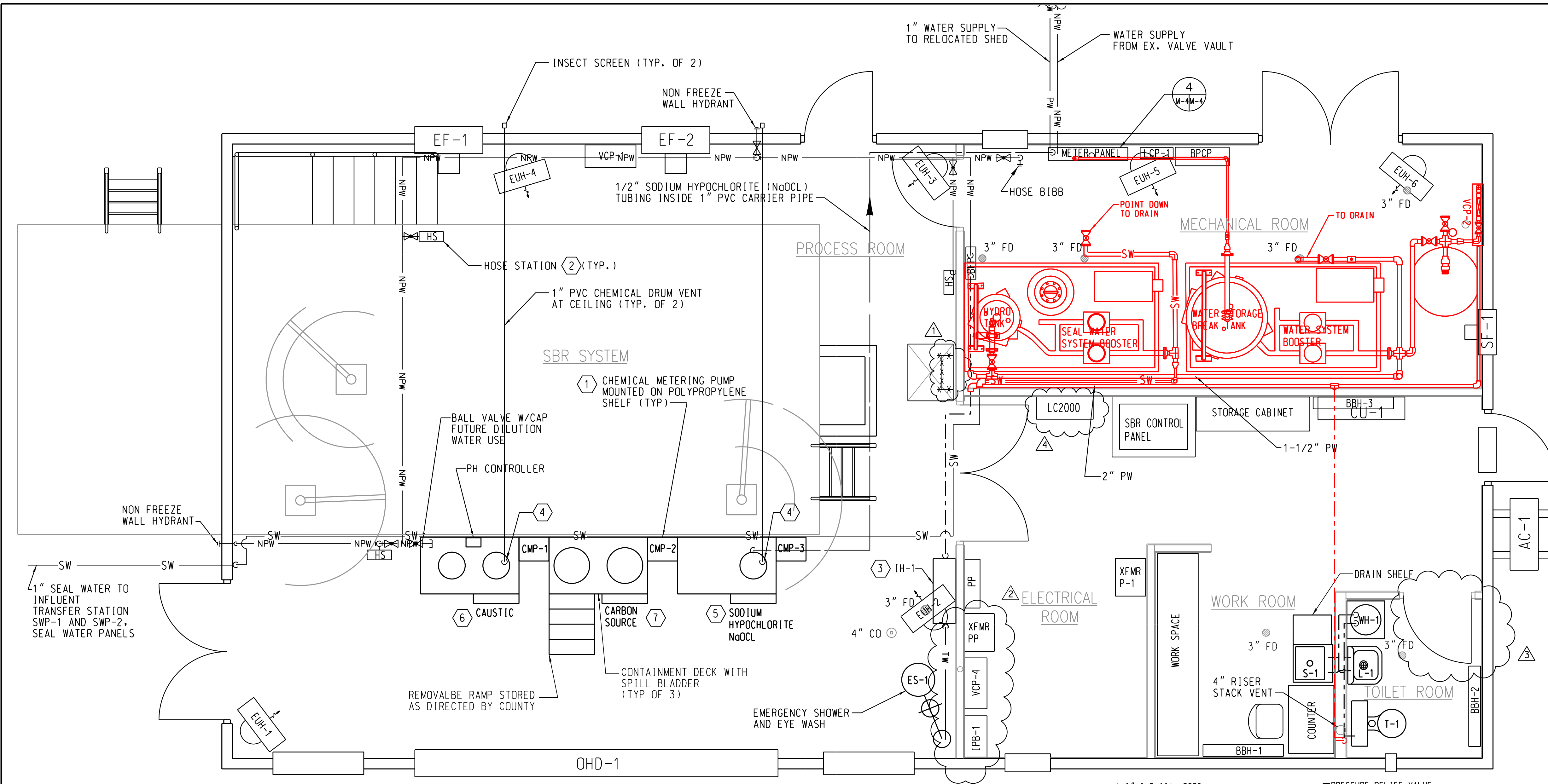
STATE OF MARYLAND
ENGINEER
LICENSE NO. 33925
EXPIRATION DATE: 01/15/2021

DES:	KFJ
DRN:	KFJ
CHK:	SEA
DATE:	NOVEMBER 21, 2018
AUG. 2016	
BY:	
NO.	
REVISION	

PLUMBING-
WASTE DISCHARGE

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

M-3
SCALE AS SHOWN
SHEET 19 OF 43



4 METER PANEL DETAIL
SCALE: NONE

CONSTRUCTION NOTES

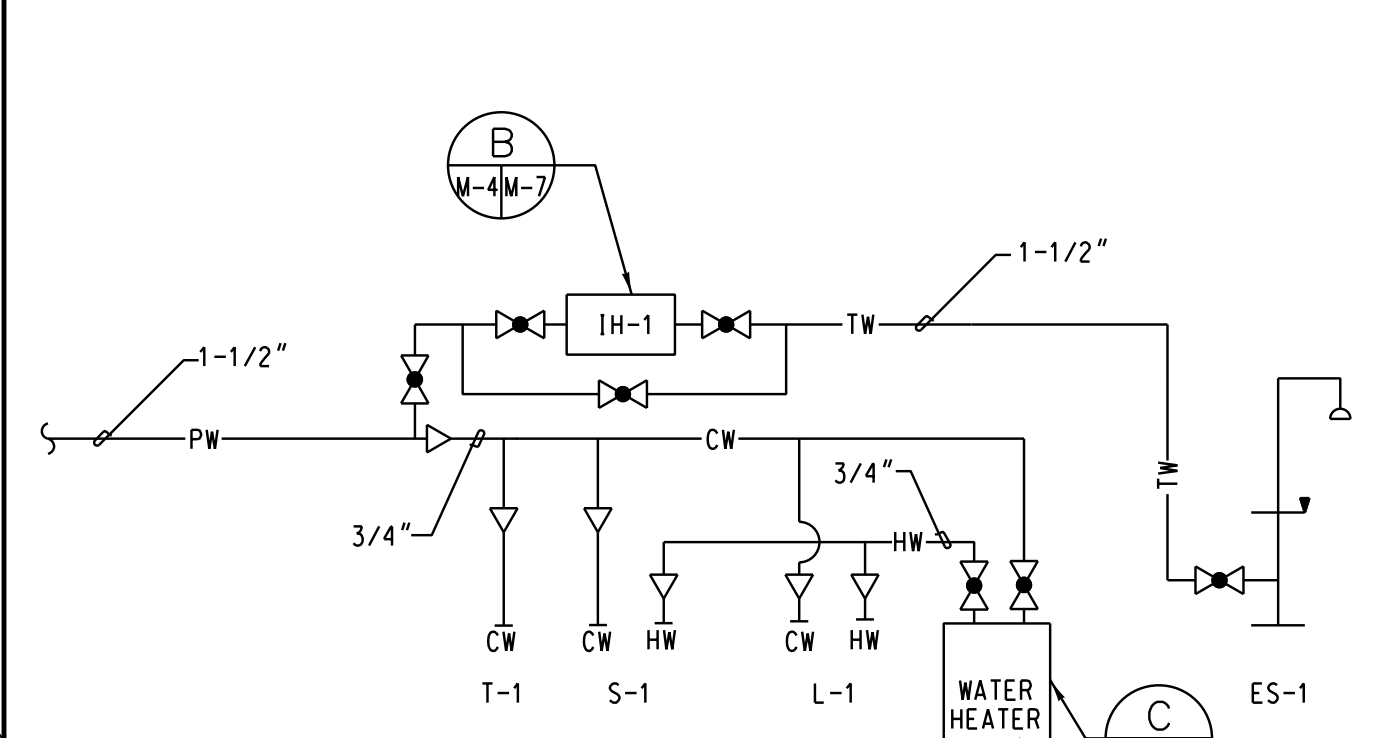
- 1 SHELF BY PUMP MANUFACTURER. SIZE TO SUIT PUMP.
- 2 PROVIDE S.S. FRAMING CHANNEL MOUNTING STAND W/BASE FITTINGS.
- 3 IN NEMA 4X ENCLOSURE.
- 4 PROVIDE 2' OF 1" FLEXIBLE TUBING WITH CONNECTION BUNG AT DRUM.
- 5 MAXIMUM 25 GAL. STORAGE.
- 6 MAXIMUM 50 GAL. STORAGE.
- 7 2 X 50 GAL. STORAGE.

LEGEND

- SW — SEAL WATER
- PW — POTABLE WATER
- NPW — NON POTABLE WATER
- — — HOT WATER
- — — COLD WATER
- — — SODIUM HYPOCHLORITE (CARRY PIPE)
- — — EXISTING WATER SYSTEM
- — — SIGNAL COMMUNICATIONS
- — — TEMPERED WATER
- — — PROP. FEATURES

EQUIPMENT NAMES

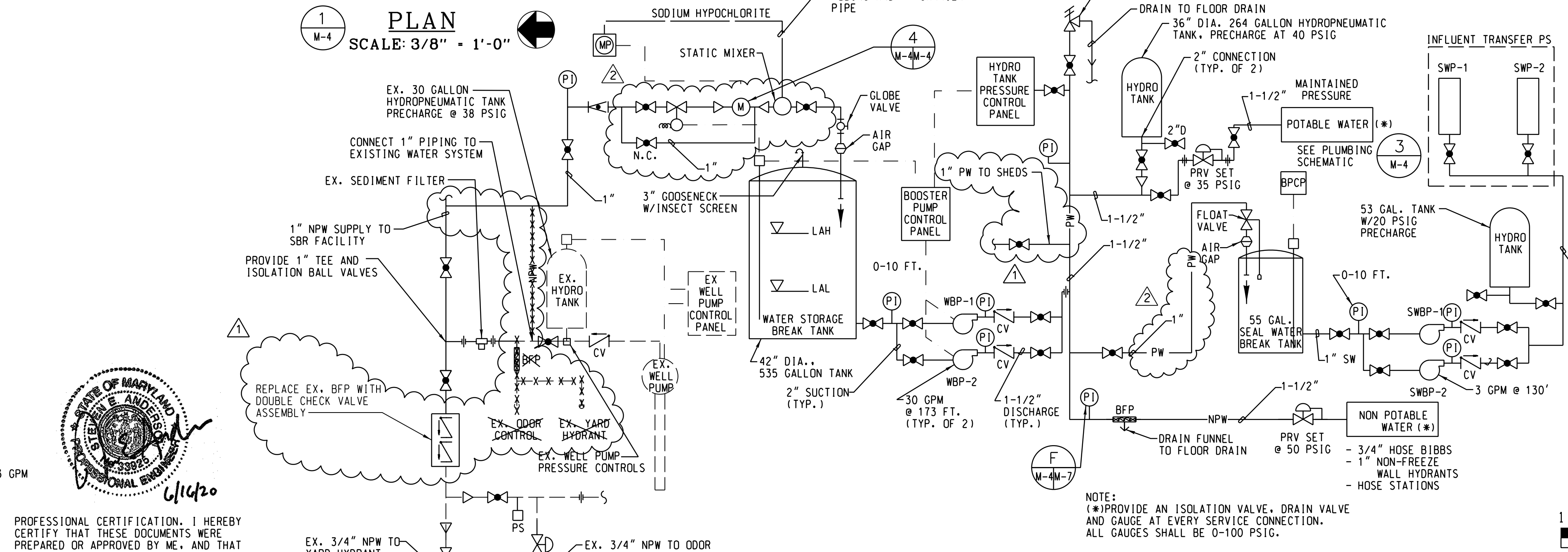
- IH INSTANTANEOUS HEATER
- HS HOSE STATION
- BFP BACKFLOW PREVENTER
- WBP WATER BOOSTER PUMP



3 PLUMBING SCHEMATIC
SCALE: NONE

FIXTURE SCHEDULE			
I.D.	DESCRIPTION	HW	CW
S-1	SERVICE SINK	1/2"	1/2"
L-1	LAVATORY	1/2"	1/2"
T-1	TOILET	-	1/2"

IH-1 INSTANTANEOUS WATER HEATER 79 KW, 480 VAC, 3-PHASE, 23° TEMPERATURE RISE @ 23 PSIG
 ES-1 EMERGENCY SHOWER/EYEWASH 1-1/4" CONNECTION, 23 GPM @ 30 PSIG
 WH-1 10 GALLON WATER HEATER, 1650W, 120 VAC, 1 PHASE, 8 GPH RECOVERY RATE @ 90° F RISE



2 POTABLE / NON POTABLE WATER SYSTEM SCHEMATIC
SCALE: NONE

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 33925 EXPIRATION DATE: 01/15/2021



AS-BUILT REPLACEMENT SHEET 12/2021 M-4

PLOTTED: 07:37 AM on Monday, December 13, 2021
 BY: Kevin E. Anderson
 FILE: M:\2007\0071378 US Drawings\007137806-M-004 Plumbing-Water System.dgn

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Kevin E. Anderson 2/6/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Kuller 2/6/17
CHIEF, BUREAU OF ENGINEERING DATE

Thomas E. Kuller 2/6/17
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES

936 RIDGEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE (410) 316-7800
FAX (410) 316-7818
WWW.KCI.COM

STATE OF MARYLAND
PROFESSIONAL ENGINEER
KEVIN E. ANDERSON
LICENSE NO. 33925
10/10/2016

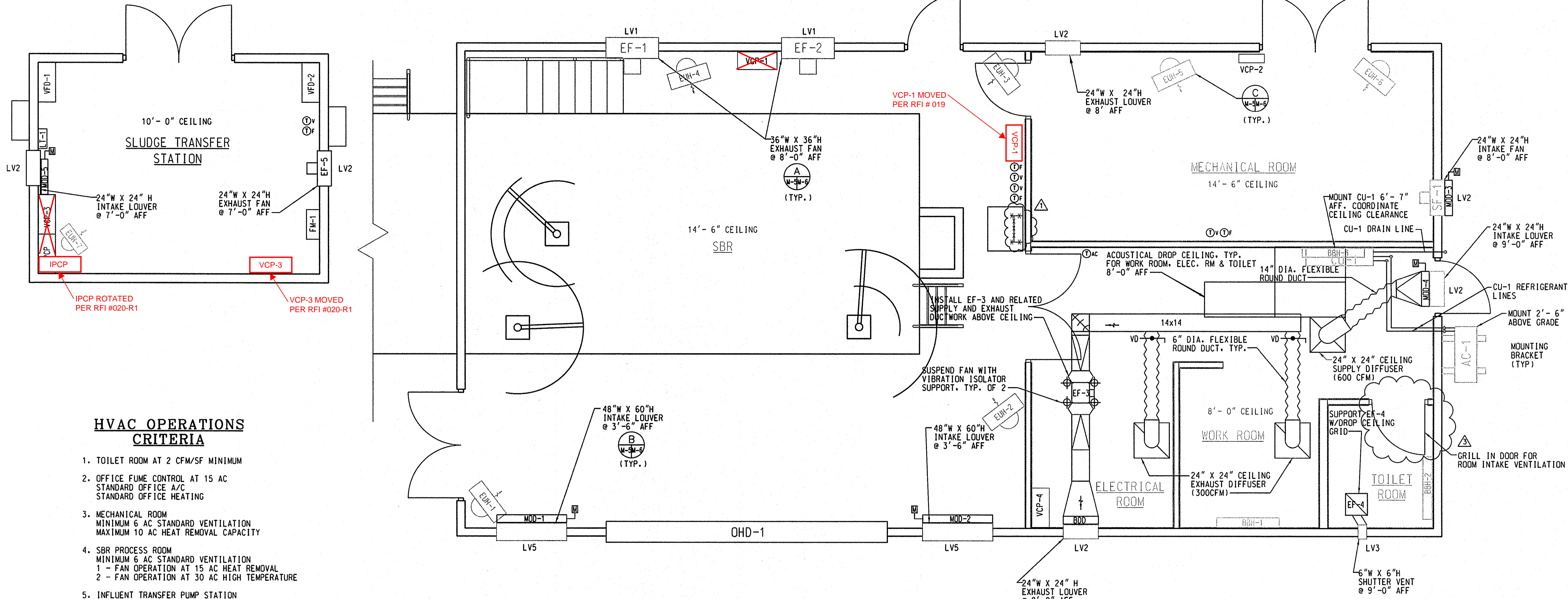
DES:	KFJ	KJ	AS-BUILT	12/21
DRN:	KFJ	JFW	RFI #002	6/20
CHK:	SEA	JFW	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20
		JFW	ADDENDUM 1	6/20
DATE:	GW	BY	NOVEMBER 21, 2018	
AUG. 2016			REVISION	

PLUMBING-
POTABLE & NON POTABLE
WATER SYSTEM

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 20 OF 43



HVAC OPERATIONS CRITERIA

- TOILET ROOM AT 2 CFM/SF MINIMUM
- OFFICE FUME CONTROL AT 15 AC STANDARD OFFICE A/C STANDARD OFFICE HEATING
- MECHANICAL ROOM MINIMUM 6 AC STANDARD VENTILATION MAXIMUM 10 AC HEAT REMOVAL CAPACITY
- SBR PROCESS ROOM MINIMUM 6 AC STANDARD VENTILATION 1 - FAN OPERATION AT 15 AC HEAT REMOVAL 2 - FAN OPERATION AT 30 AC HIGH TEMPERATURE
- INFLUENT TRANSFER PUMP STATION MINIMUM 6 AC STANDARD VENTILATION MAXIMUM 20 AC HEAT REMOVAL CAPACITY
- NFPA 820 REVIEW: SBR PROCESS IS PROCEEDED BY A PRELIMINARY TREATMENT PROCESS TANK LOCATED OUTSIDE. THEREFORE THE PRELIMINARY TREATMENT PROCESS IS CLASSIFIED CLASS-1 DIVISION-1. WHILE THE INTERIOR PROCESS TANKS ARE NON-CLASSIFIED SPACES. THE SBR PROCESS ROOM IS 1-HOUR FIRE RATED AND CLASSIFIED NEMA-4X BY NEC GUIDELINES

1 PLAN 1 SCALE: 3/8" = 1'-0"

HVAC DESIGN CRITERIA

- STANDARDS MDE/TEN STATES STANDARDS NFPA 820 CLASSIFICATIONS
- SPACE CONDITIONS OFFICE A/C AT 75°F OFFICE HEAT AT 70°F STANDARD HEATING AT 60°F STANDARD VENTILATION AT 90°F
- VENTILATION RATES MINIMUM RATE AT 6 AIR CHANGES (AC) HEAT REMOVAL TO MAINTAIN 90°F PURGE VENTILATION AT 30 AIR CHANGES (AC) FUME CONTROL AT 15 AIR CHANGES (AC)

CONSTRUCTION NOTES

- 1 SEE ARCHITECTURAL LOUVER SCHEDULE FOR BUILDER OPENING COORDINATION

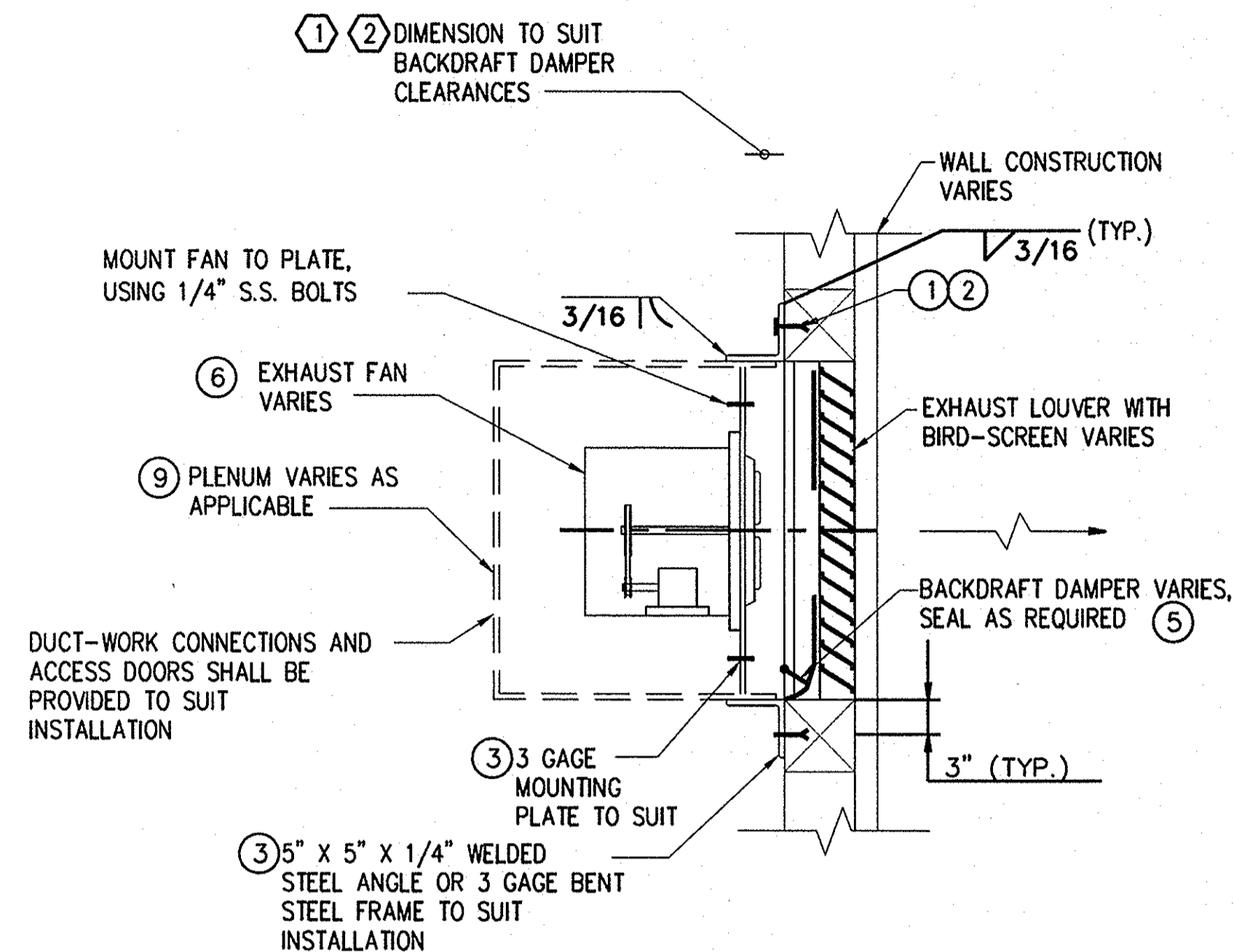
AS-BUILT
DATE 12/2021

EQUIPMENT NAMES
 BBH: BASE BOARD HEATER
 BDD: BACK DRAFT DAMPER
 EF: EXHAUST FAN
 EUH: ELECTRIC UNIT HEATER
 MOD: MOTOR OPERATED DAMPER
 SF: SUPPLY FAN
 CU: CASSETTE UNIT
 AC: AIR COOLED CONDENSING UNIT

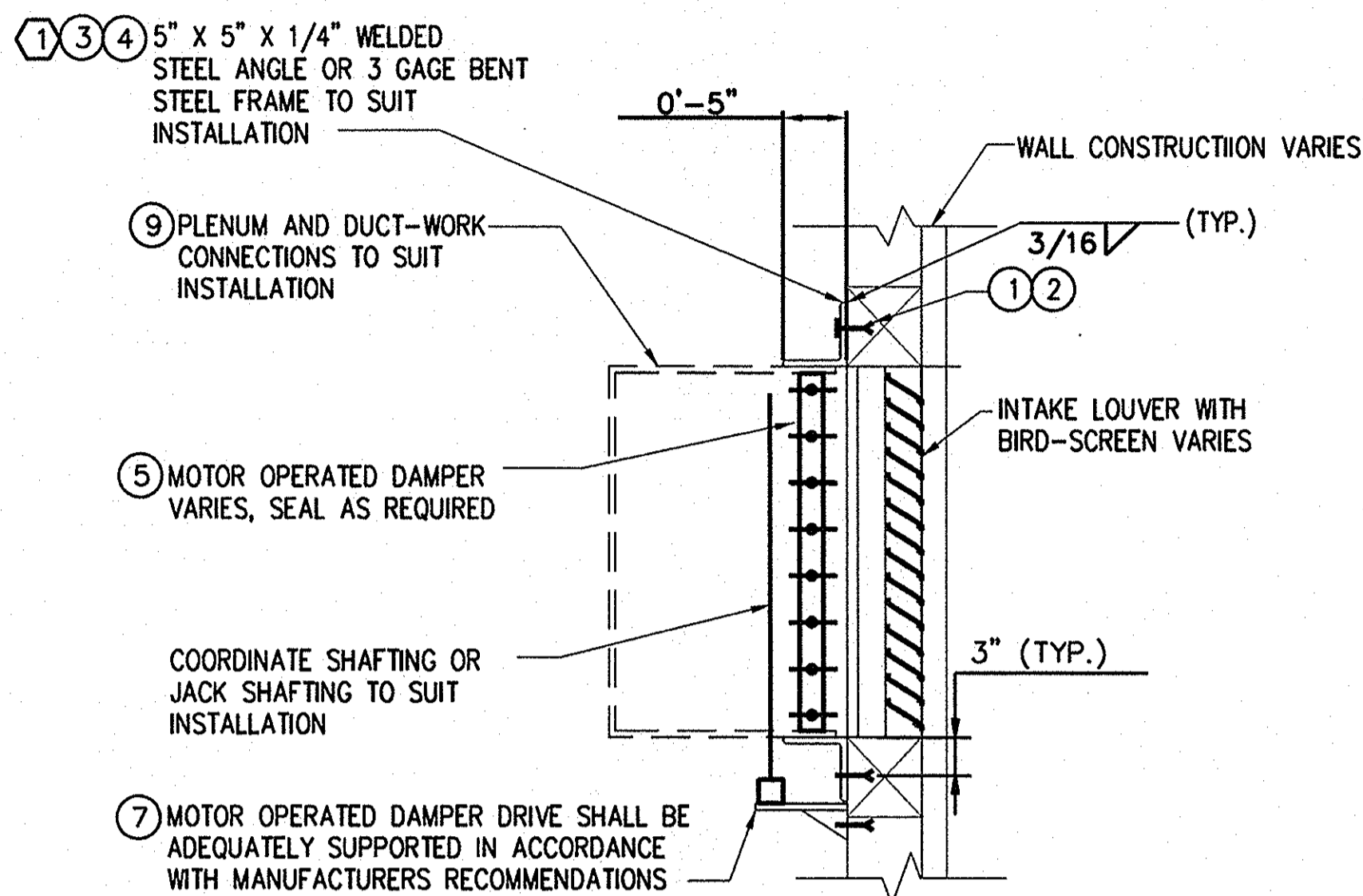
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 33925 EXPIRATION DATE: 01/15/2021



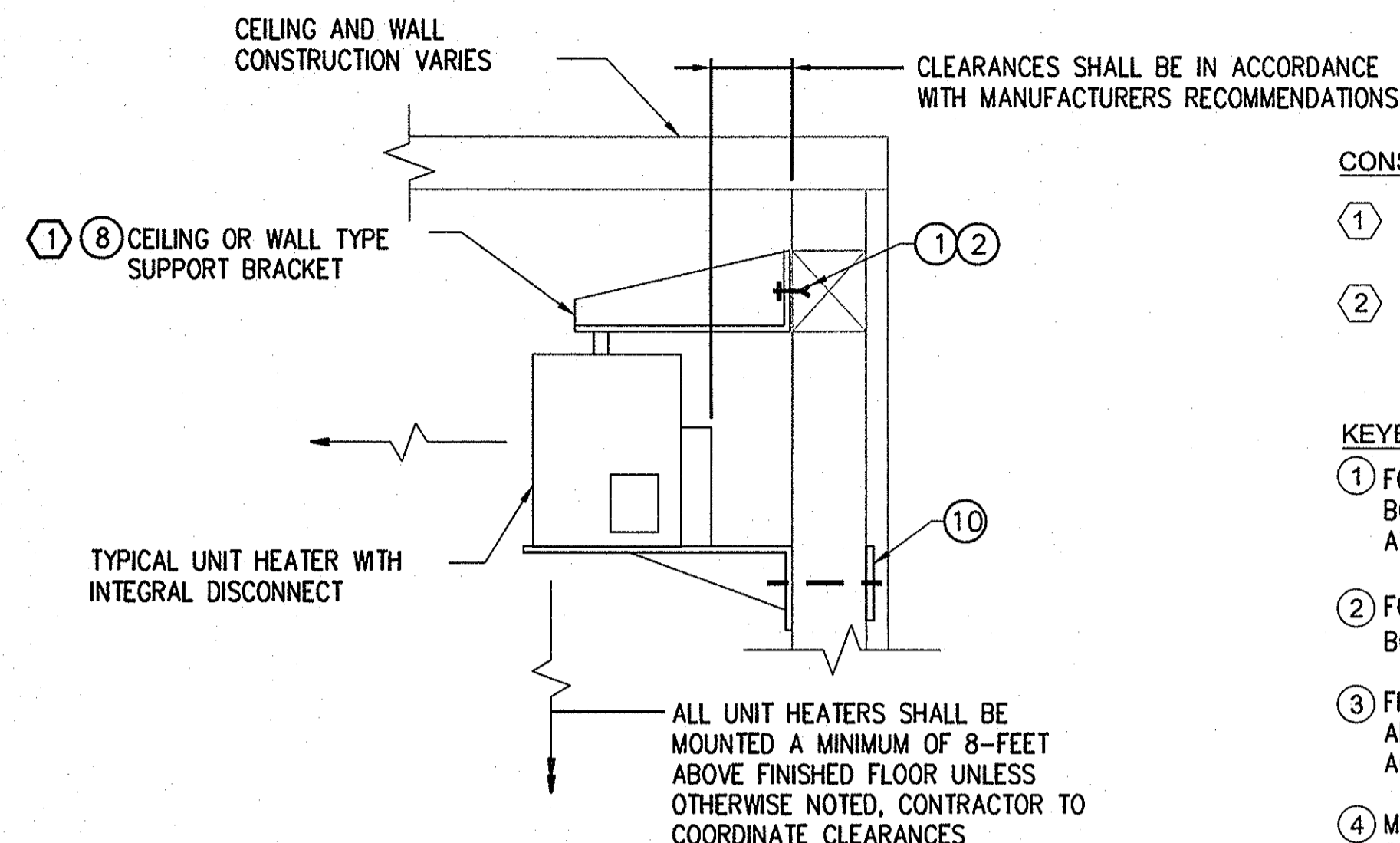
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND [Signatures and Dates]		ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS KCI TECHNOLOGIES 936 RIDGEBROOK ROAD SODAS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com		PROFESSIONAL ENGINEER STATE OF MARYLAND [Seal]		DES: KFJ DRN: KFJ CHK: SEA DATE: AUG. 2016 BY: [Signature]		AS-BUILT BUILDING PERMIT COMMENTS - HO. CO. DILP NOVEMBER 21, 2018 REVISION		12/21 6/20		HVAC PLAN AND CRITERIA		ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND		M-5 SCALE AS SHOWN SHEET 21 OF 43
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A TYPICAL EXHAUST FAN DETAIL
SCALE: NONE



B TYPICAL INTAKE DETAIL
SCALE: NONE



C TYPICAL UNIT HEATER DETAIL
SCALE: NONE

CONSTRUCTION NOTES:

- ① SEE RESPECTIVE HEATING, VENTILATION AND MECHANICAL PLANS AND SECTIONS FOR INSTALLATION REFERENCES.
- ② SEE DAMPER CLEARANCE TABLE.

KEYED NOTES:

- ① FOR WOOD FRAMING ANCHORING USE 3/8" DIA. S.S. LAG BOLTS WITH 3-INCH EMBEDMENT, OR APPROVED EQUAL SPACED AT 12-INCHES ON-CENTER.
- ② FOR METAL STUD WALL ANCHORING USE 3/8" DIA. S.S. LAG BOLTS WITH 1-1/2" EMBEDMENT AT 12 INCHES ON-CENTER.
- ③ FRAME AND MOUNTING PLATE SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION. SQUARE-CORNER FRAME CONSTRUCTION IS ACCEPTABLE, MITERED CORNERS ARE NOT REQUIRED.
- ④ MOTOR-OPERATED AND BACK DRAFT DAMPER FRAMES SHALL BE REQUIRED. INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- ⑤ ALL DAMPERS SHALL MATCH IN NOMINAL SIZE WITH THEIR RESPECTIVE LOUVERS UNLESS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS. WHERE MULTIPLE FANS SHARE A LOUVER, THE BACK DRAFT DAMPERS SHALL BE PARTITIONED FOR EACH RESPECTIVE FAN. THE DAMPER SHALL BE FAN FRAME MOUNTED OR WALL MOUNTED TO SUIT FIELD CONDITIONS.
- ⑥ ALL BELT DRIVEN FANS SHALL BE FURNISHED WITH MOTOR/BELT GUARD PROTECTIVE SCREENS, UNLESS THE FAN IS INSIDE OF A PLENUM, OR OTHERWISE SPECIFIED.
- ⑦ CONTRACTOR SHALL COORDINATE M.O.D. SHAFTING ARRANGEMENTS WITH SUITABLE FRAME.
- ⑧ CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT CHANNELS, RODS AND S.S. HARDWARE TO SUIT CEILING INSTALLATION.
- ⑨ PLENUM CONNECTIONS TO WALL FRAMES SHALL BE SUITABLE FOR MATERIALS OF CONSTRUCTION AND SHALL BE SELF-SUPPORTING IN ACCORDANCE WITH SMACNA STANDARDS.
- ⑩ UNIT HEATERS IN EXCESS OF 200 LBS. UTILIZING SHELF OR BRACKET SUPPORTS, SHALL REQUIRE THRU-BOLTS WITH 3/8-INCH THICK BEARING PLATES SPANNING HORIZONTAL BOLT CENTERS. CONTRACTOR TO COORDINATE ADDITIONAL SUPPORT FRAMING.

HEATING SCHEDULE						
UNIT I.D.	KW	AMPS	CFM	THROW (FT.)	VOLTS/PH/HERTZ	REMARKS
EUH-1	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-2	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-3	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-4	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-5	3.0	10.8	280	8	277 VAC. 1 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-6	3.0	10.8	280	8	277 VAC. 1 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-7	5.0	6.0	405	8	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
BBH-1	1.0	3.8	-	-	277 VAC. 1 - PH	INTEGRAL THERMOSTAT
BBH-2	1.0	3.8	-	-	277 VAC. 1 - PH	INTEGRAL THERMOSTAT
BBH-3	1.0	3.8	-	-	277 VAC. 1 - PH	INTEGRAL THERMOSTAT

DUCTLESS SPLIT SYSTEM AIR CONDITION - CRITERIA	
CASSETTE FAN CFM	775 DRY CFM
CASSETTE FAN FLA	0.36
MAX. CASSETTE FAN MOTOR POWER	56W
TOTAL COOLING BTUH	24,000
SENSIBLE COLLING BTUH	18,500
CONDENSER COIL EOB	93F
EVAPORATOR COIL EDB/EWB	75/62F
ELECTRICAL CHARACTERISTICS VOLT/PH/HZ	208V/1-PHASE/60HZ

DAMPER CLEARANCES	
FAN SIZE	CLEARANCE
12"	6"
16"	8"
18"	8"
20"	10"
24"	12"
30"	12"
36"	14"

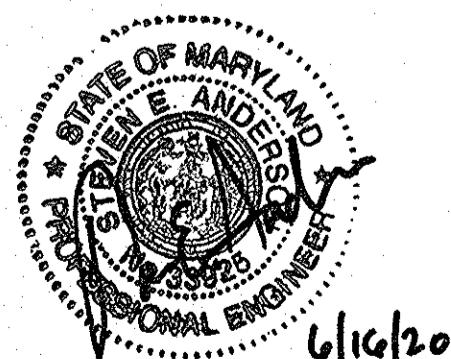
- PACKAGE SYSTEM NOTES:**
- SPACE DESIGN CONDITIONS: 75°F DB 45% RH (COOLING).
 - PROVIDE EVAPORATOR COIL AND FIN COATINGS SUITABLE FOR BLEACH FUMES AND ACIDIC CORROSIVE REACTIONS.
 - AIR CONDITIONING SYSTEM SHALL UTILIZE GREEN REFRIGERANT R-410A.

VENTILATION SCHEDULE									
UNIT I.D.	TYPE	DRIVE	TOTAL CAPACITY (CFM)	TOTAL S.P. (IN. HG)	FAN RPM	MAX. MOTOR H.P.	VOLTS/PH/HERTZ	DAMPER TYPE	REMARKS
EF-1	P	BD	3000	0.375	1163	1/2	480 VAC. 3 - PH	BDD (3)	
EF-2	P	BD	3000	0.375	1163	1/2	480 VAC. 3 - PH	BDD (3)	
EF-3	C	BD	600	0.5	1454	0.25	115 VAC. 1 - PH	BDD (3)	FUME CONTROL
EF-4	P	D	150	0.375	900	0.13	115 VAC. 1 - PH	BDD (3)	LIGHT SWITCH CONTROL
EF-5	P	D	600	0.375	1404	0.25	115 VAC. 1 - PH	BDD (3)	RHEOSTAT
SF-1	P	D	600	0.375	1404	0.25	115 VAC. 1 - PH	M.O.D. (2)	RHEOSTAT

- NOTE:**
- COORDINATE CONTROLS AND INSTALLATION DETAILS AS SHOWN ON THE CONTRACT DRAWINGS
 - ALL SUPPLY FANS REQUIRE AN EXHAUST M.O.D.
 - ALL EXHAUST FANS REQUIRE AN INTAKE M.O.D.

FAN TYPE:
 BD = BELT DRIVE
 C = CENTRIFUGAL INLINE
 D = DIRECT DRIVE
 P = PROPELLER WALL MOUNTED

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AS-BUILT
DATE 12/2021

PLOTTED/STATES BY: SUSEBARNES FILE: SFILES

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/17/17
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/17/17
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/17/17
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS

KCI TECHNOLOGIES

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STATE OF MARYLAND PROFESSIONAL ENGINEER
LICENSE NO. 33925
EXPIRATION DATE: 10/10/2016

DES:	KFJ				
DRN:	KFJ				
CHK:	SEA				
DATE:	AUG. 2016	BY	NO.	REVISION	DATE

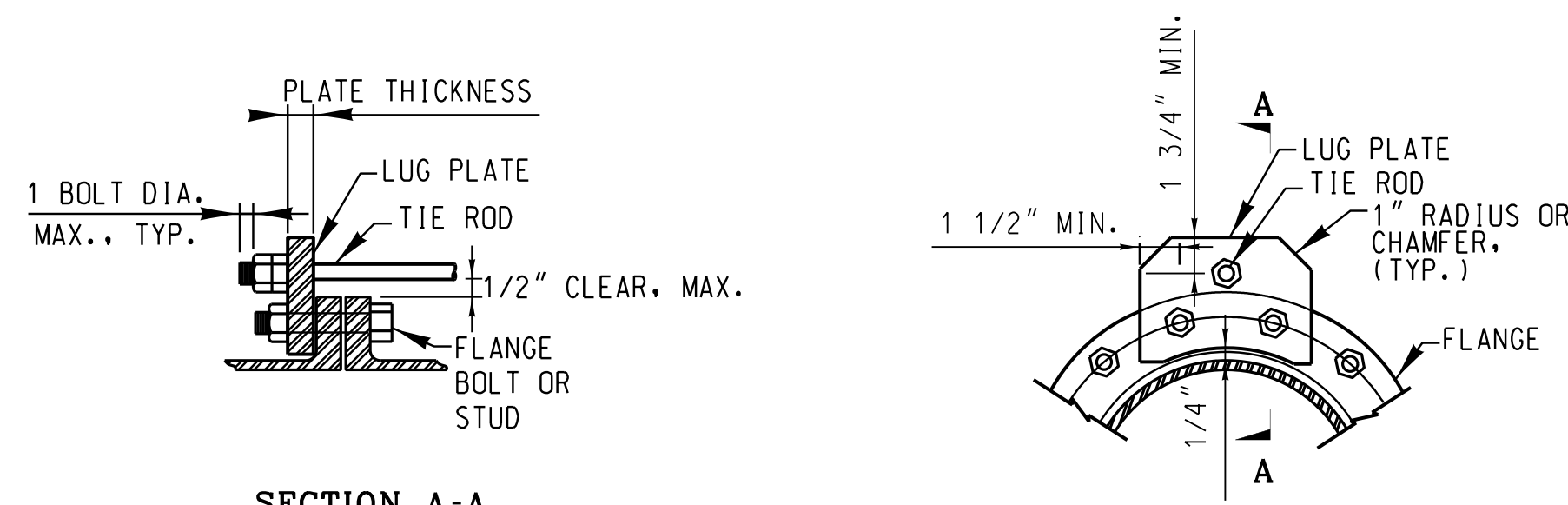
HVAC SCHEDULES AND DETAILS

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

M-6
SCALE AS SHOWN
SHEET 22 OF 43



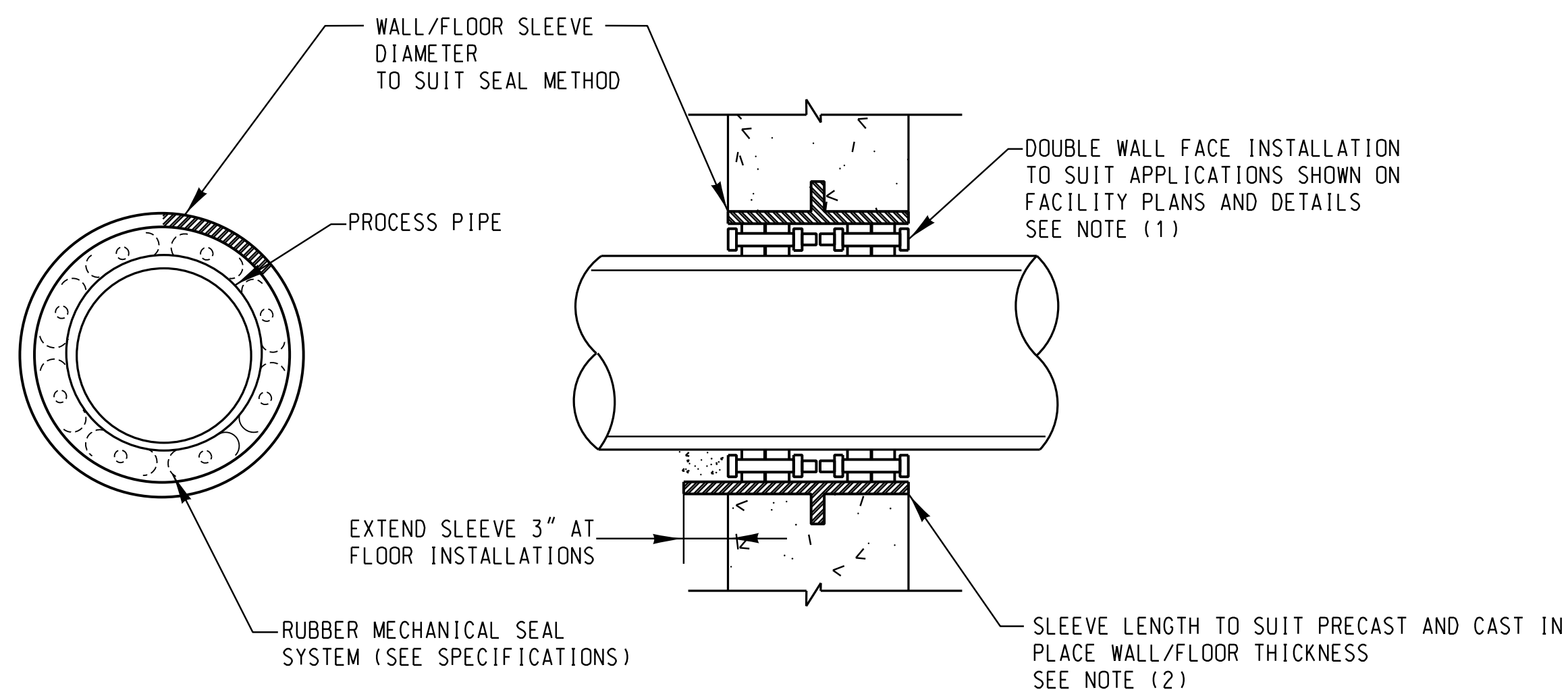
SECTION A-A

PIPE SIZE	NUMBER OF RODS	DIAMETER OF RODS	PLATE THICKNESS	PIPE SLEEVE (IF REQUIRED)	DESIGN PRESSURE (PSI)
3"	2	3/4"	3/4"	7/8"	150
4"	2	3/4"	3/4"	7/8"	150

NOTES:
FLANGE SURFACE IN CONTACT WITH THE LUG PLATE SHALL BE GROUND SMOOTH TO CLEAR THE CASTING IRREGULARITY AND EMBOSSED LETTERING. CONTACT SURFACE OF LUG PLATE SHALL BE MACHINED TO A ONE DEGREE TAPER FOR PIPE DIAMETERS 12-INCH AND LARGER.

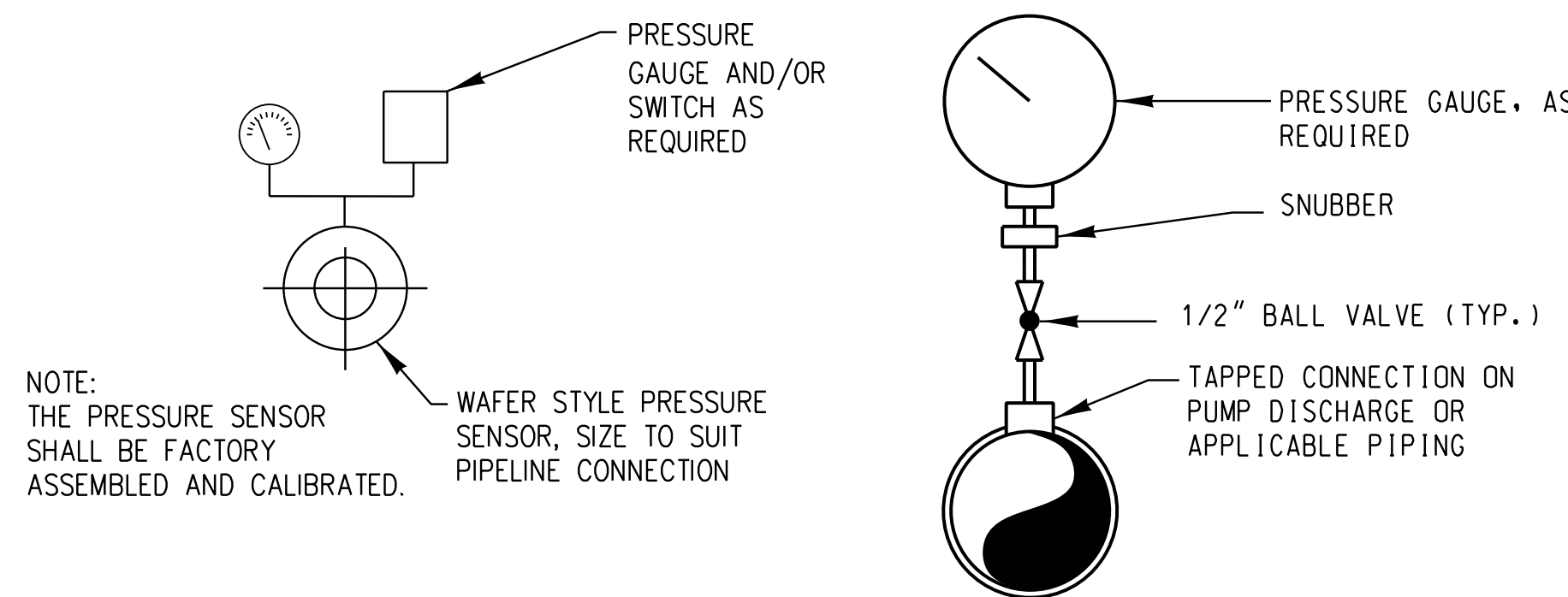
ROD MATERIAL - ASTM A588
PLATE MATERIAL - ASTM A36
SLEEVE MATERIAL - SCHEDULE 40 STEEL PIPE

A TIE ROD INSTALLATION DETAIL
SCALE: NONE



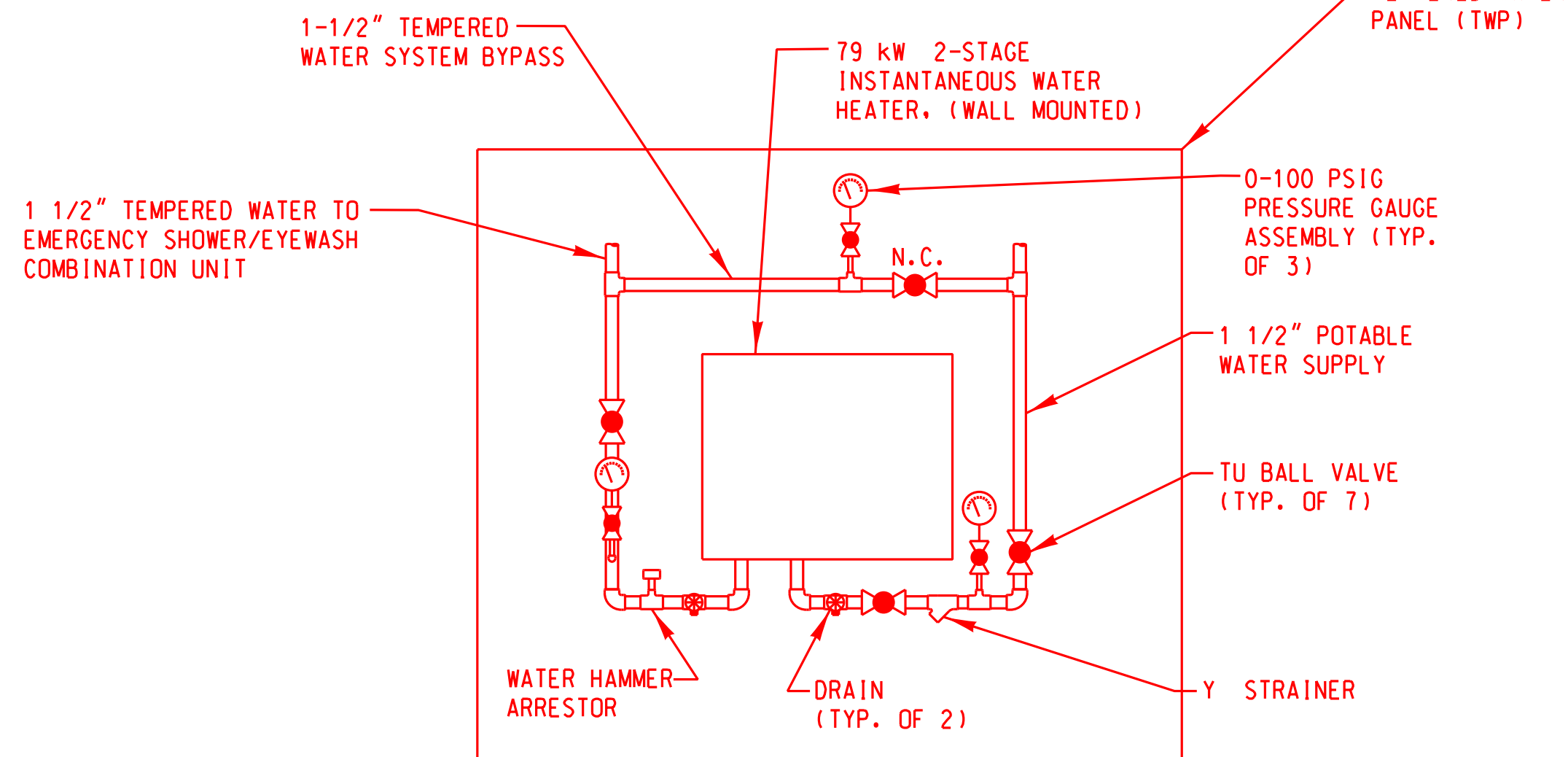
NOTES:
(1) PROVIDE NON SHRINK GROUT SEAL AT FLOOR SLEEVE LOCATIONS.
(2) EXISTING WALL AND FLOOR CORES DO NOT REQUIRE SLEEVE INSTALLATION.

D PIPE THROUGH WALL/FLOOR DETAIL
SCALE: NONE

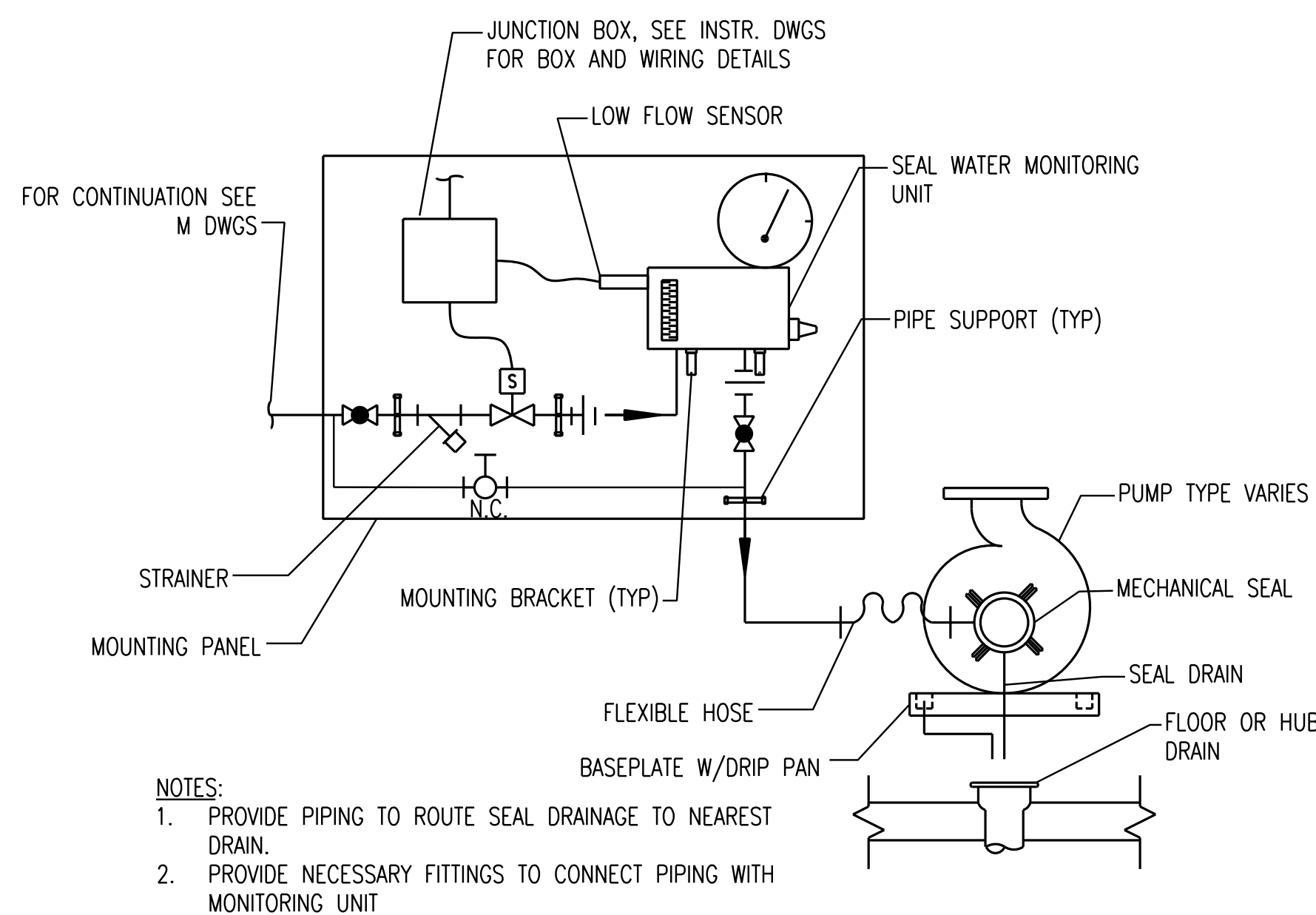


E SEWAGE/SLUDGE PRESSURE SENSOR DETAIL
SCALE: NONE

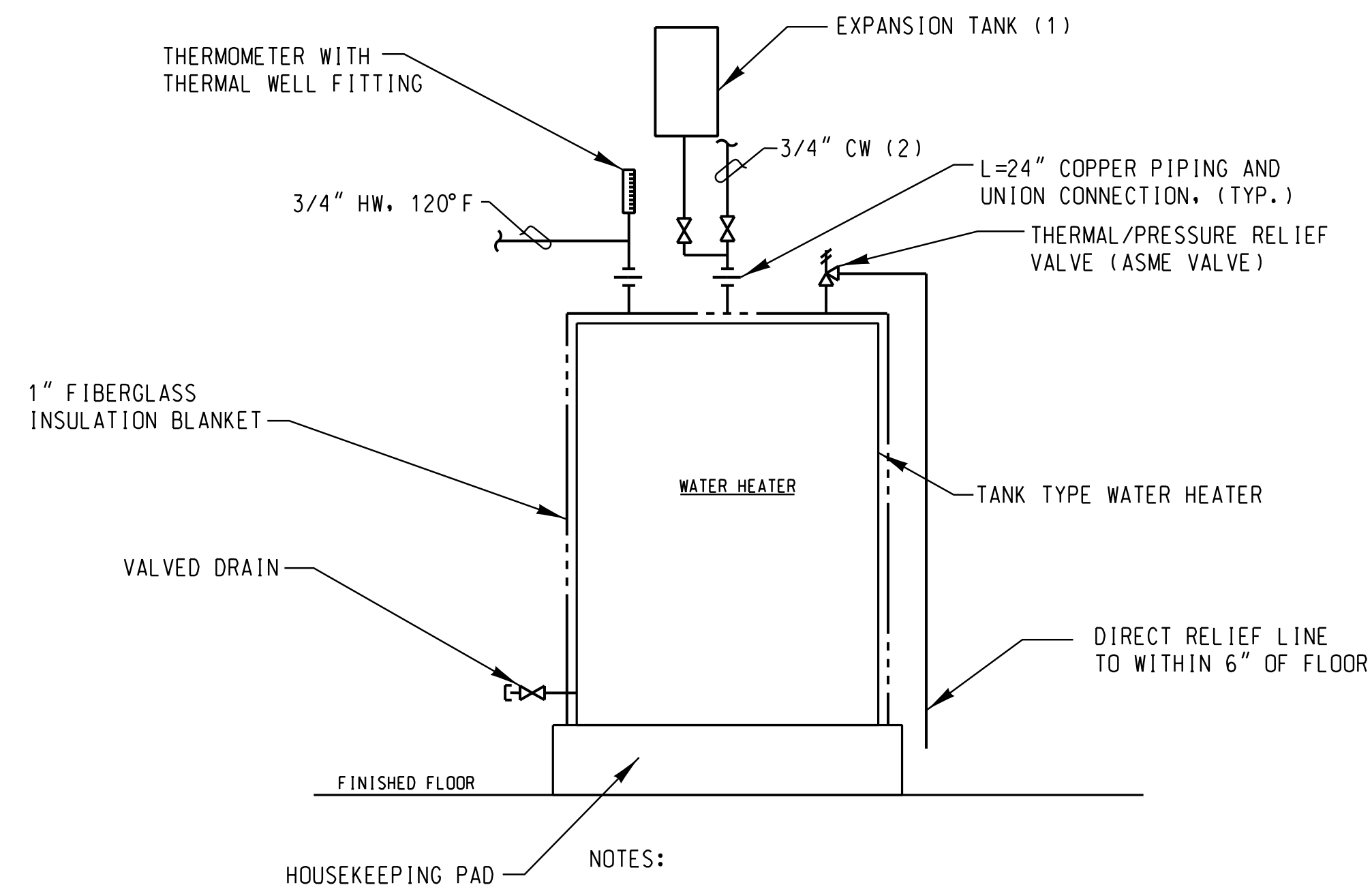
F PW/NPW PRESSURE GAUGE DETAIL
SCALE: NONE



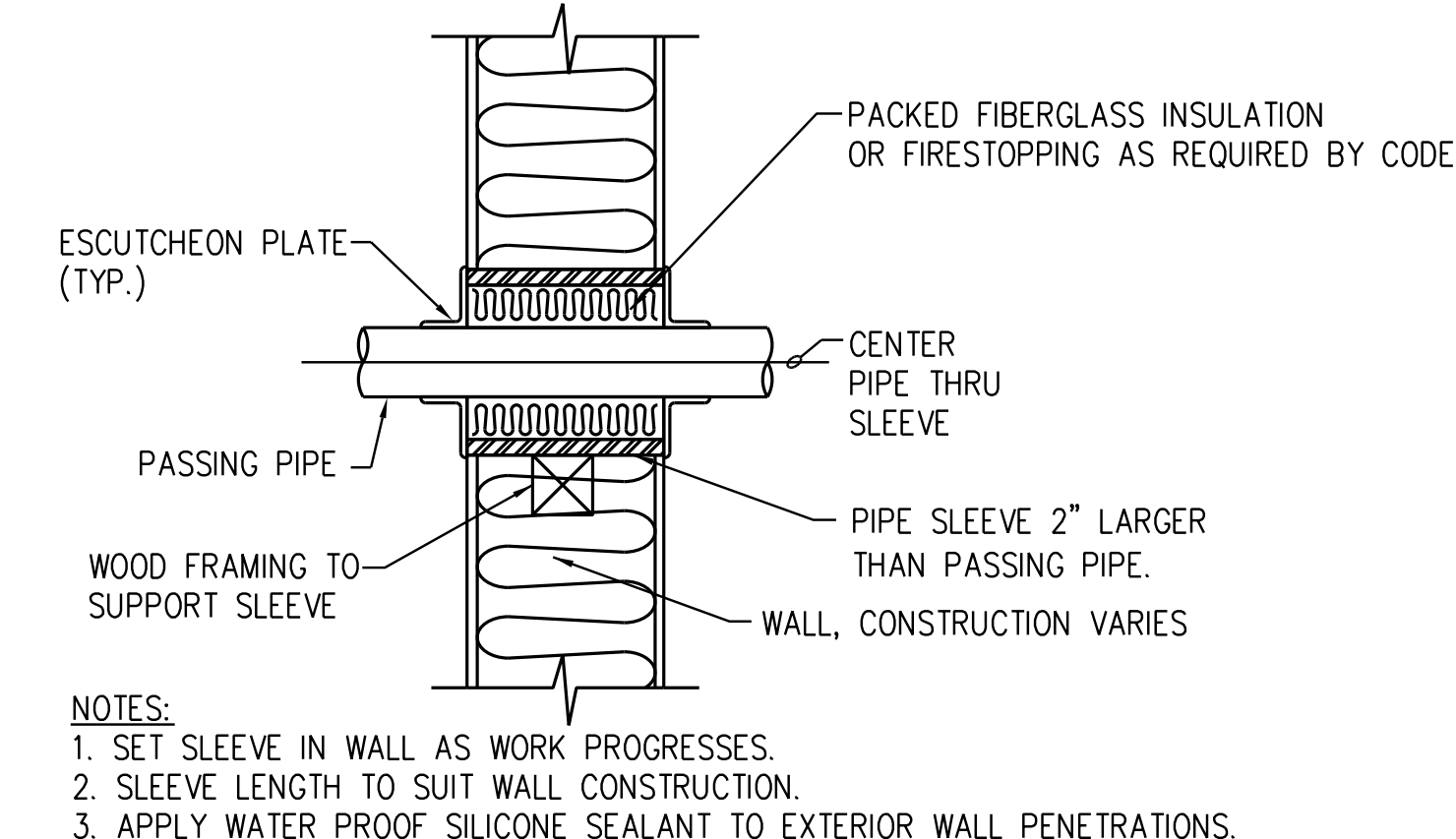
B TEMPERED WATER PANEL DETAIL
SCALE: NONE



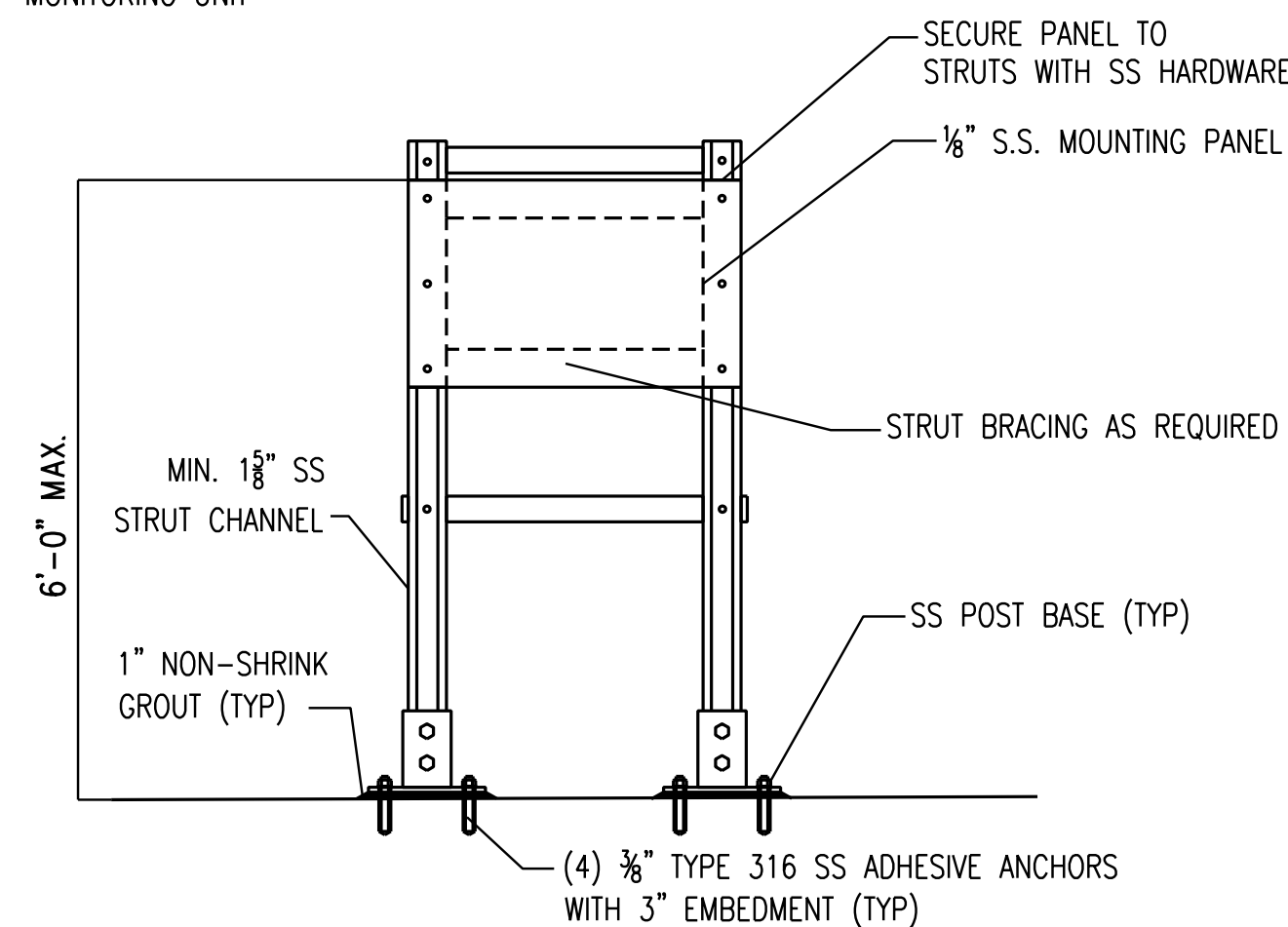
G SEAL WATER PANEL DETAIL
SCALE: NONE



C ELECTRIC WATER HEATER DETAIL
SCALE: NONE



H PIPE SLEEVE-WOOD FRAME WALL DETAIL
SCALE: NONE



J FLUSHING CONNECTION DETAIL
SCALE: NONE

AS-BUILT REPLACEMENT SHEET 12/2021

PLOTTED: 08:36 AM on Friday, December 10, 2021
BY: Kevin Jackson
FILE: M-2607-00071378-05-Drawings-007137806-M-007-Mechanical Details.dgn

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Kevin Jackson 2/17/21
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Butler 2/17/21
CHIEF, BUREAU OF ENGINEERING DATE

John A. ... 11/25/20
CHIEF, BUREAU OF UTILITIES DATE

... 2/17/21
CHIEF, UTILITY DESIGN DIVISION DATE

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DRN:	KFJ				
CHK:	SEA				
DATE:	AUG. 2016	BY:	KJ	NO.	AS-BUILT
DATE:	12/21	REVISION:			

MECHANICAL DETAILS

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

M-7
SCALE AS SHOWN
SHEET
23 OF 43

ELECTRICAL GENERAL NOTES

- INSTALL WORK IN ACCORDANCE WITH THE 2017 EDITION OF NFPA 70 NATIONAL ELECTRICAL CODE, 2018 EDITION OF THE INTERNATIONAL BUILDING CODE, 2018 EDITION OF NFPA 101 LIFE SAFETY CODE, 2018 EDITION OF INTERNATIONAL MECHANICAL CODE, 2018 EDITION OF NFPA 70E STANDARD OF FOR ELECTRICAL SAFETY IN THE WORK PLACE, APPLICABLE SECTIONS OF OSHA OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION REGULATIONS - LATEST EDITION, AND AUTHORITIES HAVING JURISDICTION.
- PROVIDE MATERIALS THAT ARE NEW, OF THE BEST OF THEIR RESPECTIVE KINDS, WITHOUT IMPERFECTIONS OR BLEMISHES, AND PROTECTED FROM THE ELEMENTS PRIOR TO CONSTRUCTION.
- COMPLY WITH OWNER'S USE OF PREMISES AND SAFETY REGULATIONS.
- SECURE ALL PERMITS REQUIRED FOR ELECTRICAL WORK. SCHEDULE INSPECTIONS OF THE ELECTRICAL SYSTEMS. ELECTRICAL INSPECTIONS WILL BE PERFORMED BY THE AUTHORITIES HAVING JURISDICTION.
- ALL EXISTING ELECTRICAL SYSTEMS (INCLUDING LIGHTING, POWER, SECURITY, FIRE ALARM, AND EMERGENCY) MUST REMAIN OPERATIONAL. COORDINATE AND SCHEDULE ALL REQUIRED OUTAGES WITH CONSTRUCTION MANAGER WITH A MINIMUM OF 14 DAYS ADVANCE NOTICE. CONFIRM WITH CONSTRUCTION MANAGER ALL CONDITIONS/INSTANCES WHERE EXISTING EQUIPMENT WILL BE REQUIRED TO BE DE-ENERGIZED TO MAKE NEW CONNECTIONS. THIS APPLIES TO ALL ELECTRICAL EQUIPMENT. CONFIRMATION SHALL INCLUDE THE PROPER PROCEDURES (ADMINISTRATIVE AND SAFETY) REQUIRED TO COORDINATE AND SCHEDULE WITH CONSTRUCTION MANAGER ALL REQUIRED POWER OUTAGES.
- FIELD VERIFY DEMOLITION REQUIREMENTS AND EXISTING CONDITIONS.
- CENTER EQUIPMENT OR DEVICES LOCATED ABOVE OPENINGS SUCH AS DOORS, LOUVERS, ETC. ABOVE THE OPENING. THIS NOTE REFERS TO, BUT IS NOT LIMITED TO, EXIT LIGHTS, EXTERIOR LIGHT FIXTURES OVER REQUIRED MEANS OF EXIT DISCHARGE, ETC.
- COORDINATE LOCATIONS OF ALL ELECTRICAL EQUIPMENT AND LOCATION/ROUTING OF ALL ELECTRICAL FEEDERS (AND ASSOCIATED PULLBOXES) AND BRANCH CIRCUITS WITH ALL OTHER UTILITIES (EXISTING AND NEW), WITH STRUCTURE, AND WITH BUILDING ELEMENTS.
- UNLESS NOTED OTHERWISE, EVERY CONDUIT CONTAINING 120V OR GREATER WIRING SHALL CONTAIN A SEPARATE INSULATED GROUND WIRE RATED FOR 600V.
- PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL BRANCH CIRCUITS UTILIZING A NEUTRAL (I.E. 120V, 277V, ETC). PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL FEEDERS REQUIRING A NEUTRAL (I.E. 1 PHASE-3 WIRE, 3 PHASE-4 WIRE FEEDERS). SHARING OF NEUTRAL CONDUCTORS BETWEEN ANY CIRCUIT (BRANCH OR FEEDER) IS NOT PERMITTED. MULTI-WIRE BRANCH CIRCUITS ARE NOT PERMITTED.
- PROVIDE STRUCTURAL FRAME SUPPORTS AS REQUIRED FOR DISCONNECT SWITCHES, MOTOR STARTERS, PANELBOARDS, TRANSFORMERS, CONTACTORS, ETC. (IF DISCONNECT SWITCHES OR STARTERS ARE LOCATED ON EQUIPMENT HOUSINGS, COORDINATE LOCATIONS WITH EQUIPMENT SUPPLIER TO ENSURE SWITCHES/STARTERS ARE NOT INSTALLED ON EQUIPMENT ACCESS PANELS). MAINTAIN PROPER NATIONAL ELECTRICAL CODE CLEARANCES. IN ADDITION, MAINTAIN PROPER MECHANICAL WORKING CLEARANCES FOR SERVICING OF EQUIPMENT.
- UNLESS INDICATED OTHERWISE, PROVIDE ALL REQUIRED EQUIPMENT CONNECTIONS. THIS INCLUDES WIRING AND CONDUIT FROM LOCAL DISCONNECTING MEANS TO MOTOR TERMINALS OF ALL EQUIPMENT (GENERAL CONSTRUCTION, HVAC, PLUMBING, FIRE PROTECTION, OWNER FURNISHED EQUIPMENT, ETC.).
- COORDINATE ROOF PENETRATIONS FOR MECHANICAL EQUIPMENT WITH WORK OF MECHANICAL CONTRACT.
- REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR LOCATIONS OF ALL BUILDING EXPANSION JOINTS. PROVIDE CONDUIT EXPANSION-JOINT FITTINGS AS SPECIFIED.
- PROVIDE UNSWITCHED HOT CONDUCTOR TO ALL EXIT SIGNS (LIFE SAFETY NORMAL EMERGENCY APPLICATIONS). UNLESS INDICATED OTHERWISE, PROVIDE (2)#12, (1)#12G-3/4" TO EACH EXIT SIGN.
- UNLESS INDICATED OTHERWISE, CONNECT EMERGENCY BATTERY PACKS TO THE NORMAL LIGHTING CIRCUIT LOCATED IN THE SAME SPACE AS THE BATTERY PACKS. CONNECT BATTERY PACKS AHEAD OF SWITCHING, UNLESS INDICATED OTHERWISE, WIRING AND CONDUIT SHALL CONSIST OF (2)#12, (1)#12G-3/4".
- 12VDC WIRING FROM ALL EMERGENCY BATTERY PACKS TO ASSOCIATED REMOTE HEADS SHALL BE A MINIMUM OF (2)#12 AWG IN 3/4" CONDUIT (FROM EMERGENCY BATTERY PACK TO END DEVICE) F
- SIZE SUPPORTS FOR MULTIPLE RACEWAY INSTALLATIONS SO CAPACITY CAN BE INCREASED BY A MINIMUM 25 PERCENT IN THE FUTURE OR GREATER AS INDICATED.
- PAINT ALL PLYWOOD BACKBOARDS (MINIMUM 2 COATS FIRE RETARDANT PAINT) TO MATCH WALL FINISH.
- CONFIRM ALL EQUIPMENT LOCATIONS AND PLUG TYPES PRIOR TO RECEPTACLE INSTALLATION. PROVIDE RECEPTACLE TYPES TO MATCH PLUG TYPES AND NEMA CONFIGURATION. THIS INCLUDES THE USE OF TWISTLOCK DEVICES.
- CONFIRM ALL WIRING DEVICE, DATA/VOICE BOXES, AND OWNER EQUIPMENT LOCATIONS PRIOR TO COMMENCING WORK.
- SUPPORT ALL LOW VOLTAGE CABLING ABOVE ACCESSIBLE CEILINGS WITH J-HOOKS SPACED AT MAXIMUM 4'-0" INTERVALS.
- INCLUDE THE FOLLOWING ADDITIONAL EQUIPMENT AND DEVICES IN THE COST FOR THE PROJECT FOR INSTALLATION AS DIRECTED BY AUTHORITY HAVING JURISDICTION REVIEW: UNIVERSAL EXIT SIGNS - FIVE (5) OF EACH STYLE FIRE ALARM HORN/STROBE - FIVE (5)
- PROVIDE ALL CUTTING, PATCHING, AND ACCESS PANELS REQUIRED FOR ELECTRICAL WORK. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES.
- ALL EXISTING OR NEW EXPOSED CONDUIT SHALL BE PAINTED THE SAME COLOR OF THE CEILING OR WALL. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL PLANS FOR PROPER PAINT COLORS.
- WHERE EXISTING CONSTRUCTION ALLOWS WALLS TO BE "FISHED," INSTALL WIRING CONCEALED IN WALL CONSTRUCTION WITH CONDUIT. WHERE EXISTING CONSTRUCTION DOES NOT ALLOW WALLS TO BE "FISHED" AND WHERE SPECIFICALLY APPROVED BY THE ENGINEER, SURFACE METAL RACEWAY MAY BE UTILIZED TO EXTEND WIRING FROM THE SURFACE MOUNTED DEVICE VERTICALLY TO ABOVE ACCESSIBLE CEILING. WHERE SURFACE METAL RACEWAY IS UTILIZED, PROVIDE COMPATIBLE OUTLET BOXES BY THE SAME MANUFACTURER AS THE SURFACE METAL RACEWAY.
- CONTRACTOR SHALL FURNISH ANY AND ALL PERMITS REQUIRED FOR THE DEMOLITION AND INSTALLATION OF THIS WORK. COORDINATE WITH THE LOCAL AUTHORITY HAVING JURISDICTION AND/OR CODE INSPECTORS TO SCHEDULE ALL INSPECTIONS REQUIRED AS APPROPRIATE DURING THE CONSTRUCTION. PROVIDE REMEDIES FOR ANY VIOLATIONS NOTED BY THE INSPECTOR.
- PROVIDE ANY/ALL MISCELLANEOUS FITTINGS, BENDS, CONNECTORS, AND APPURTENANCES NECESSARY FOR A COMPLETE AND FUNCTIONAL SYSTEM WHETHER EXPLICITLY SHOWN OR NOT. PROVIDE NAIL PLATES AND SIMILAR PROTECTION FOR SYSTEMS AS REQUIRED BY THE CODE.
- CONTRACTOR SHALL USE ONLY NEW, HEAVY DUTY, COMMERCIAL GRADE MATERIALS. ALL MATERIALS AND EQUIPMENT USED SHALL BE LISTED AND LABELED FOR THE APPLICATION IN WHICH THEY ARE USED.
- COORDINATE INSTALLATION OF MECHANICAL AND ELECTRICAL INSTALLATIONS AROUND OTHER SYSTEMS AND BUILDING STRUCTURE TO AVOID OBSTRUCTIONS AND PRESERVE CLEARANCES. LOCATE AND INSTALL COMPONENTS REQUIRING ACCESS SO THAT THEY MAY BE SERVICED, RESET, REPLACED AND/OR RECALIBRATED WITH NORMAL TOOLS AND EQUIPMENT.
- OPENINGS MADE FOR MECHANICAL AND ELECTRICAL EQUIPMENT AND SYSTEMS SHALL BE NEAT AND OF A MINIMUM SIZE. SEAL AROUND OPENINGS WITH APPROPRIATE MATERIALS TO PRESENT A FINISHED APPEARANCE AND PROVIDE SUITABLE WEATHERPROOFING.
- INSTALL ALL ELECTRICAL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. EQUIPMENT, DEVICES AND MATERIALS OF SIMILAR FUNCTION, TYPE, OR SYSTEM SHALL BE OF THE SAME MANUFACTURER.
- PROVIDE HANGERS, SUPPORTS, AND SWAY BRACING FOR PIPING, DUCTWORK AND CONDUIT IN ACCORDANCE WITH THE APPROPRIATE CODE AND MATERIAL TYPE. PROVIDE APPROPRIATELY SIZED SLEEVES WHERE PIPING AND CONDUITS PENETRATE FOUNDATIONS. DO NOT CUT OR ALTER ANY STRUCTURAL MEMBERS OR COMPONENTS WITHOUT THE WRITTEN PERMISSION AND APPROVAL OF THE ARCHITECT AND/OR REGISTERED DESIGN PROFESSIONAL.
- PROVIDE FIRE PROOFING MATERIALS NECESSARY TO MAINTAIN CODE REQUIRED FIRE AND SMOKE BARRIERS AT ALL MECHANICAL AND ELECTRICAL SYSTEM PENETRATIONS. INSTALL MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S SYSTEMS SHEETS APPROPRIATE FOR THE SPECIFIC INSTALLATION. MAINTAIN SYSTEMS SHEETS ON SITE FOR THE INSPECTORS REFERENCE DURING INSPECTIONS.
- PROVIDE ALL EXCAVATION, TRENCHING, SHORING, BEDDING, SAWCUTTING AND BACKFILLING AS NECESSARY TO SUPPORT THE ELECTRICAL SYSTEMS INSTALLATIONS. CONTACT THE APPROPRIATE STATE AGENCY AND/OR UTILITIES IN ADVANCE PRIOR TO DIGGING.
- PROVIDE IDENTIFICATION FOR ALL ELECTRICAL SYSTEMS AS REQUIRED BY THE APPLICABLE CODES.
- DRAWINGS DEPICT GENERAL LOCATIONS FOR NEW & EXISTING ITEMS. CONTRACTOR SHOULD EXPECT SOME VARIATION AND SHALL ACCOMMODATE WITHOUT ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE PROPOSED EQUIPMENT TO INSURE THAT EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.
- PROVIDE AS-BUILT DRAWINGS AND OPERATING AND MAINTENANCE MANUALS TO THE BUILDING OWNER UPON COMPLETION OF THE PROJECT.
- PROVIDE EQUIPMENT SUBMITTALS UNDER THE PROVISIONS OF THE DIVISION 16 SPECIFICATIONS. NO EQUIPMENT SHALL BE INSTALLED WITHOUT PRIOR ACCEPTANCE BY THE ENGINEER. BRING AREAS OF POTENTIAL CONFLICT TO THE COUNTY'S ATTENTION.
- ALL EQUIPMENT POWER OUTAGES FOR DEMOLITION SHALL BE COORDINATED WITH THE PLANT OPERATION PRIOR TO REMOVAL. OUTAGES SHALL BE SUBMITTED PER COUNTY NOTIFICATION REQUIREMENT IN ADVANCE TO THE SCHEDULED POWER OUTAGE. THE COUNTY RESERVES THE RIGHT TO REJECT ANY REQUEST FOR AN OUTAGE. IN SOME CASES IT MAY BE NECESSARY, AT CONTRACTOR'S EXPENSE, TO EITHER INSTALL TEMPORARY FACILITIES FOR SERVICE OR SCHEDULE THE WORK DURING A PERIOD WHEN THE OUTAGE WOULD HAVE MINIMAL IMPACT ON THE TREATMENT PROCESS.
- IN CASES OF DOUBT AS TO THE WORK INTENDED, OR IN THE EVENT OF NEED FOR EXPLANATION THEREOF, THE CONTRACTOR SHALL REQUEST SUPPLEMENTARY INSTRUCTIONS FROM THE COUNTY. NO CHANGES ARE TO BE MADE TO THE WORK OF THIS CONTRACT WITHOUT PRIOR KNOWLEDGE AND APPROVAL OF THE COUNTY. THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK, WHICH HE EXPECTS ADDITIONAL COMPENSATION BEYOND THE CONTRACT AMOUNT, WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY. FAILURE TO OBTAIN SUCH AUTHORIZATION SHALL INVALIDATE ANY CLAIM FOR EXTRA COMPENSATION.
- A SET OF MEP RECORD/COORDINATION DRAWINGS SHALL BE MAINTAINED IN THE CONTRACTORS OFFICE AT THE JOB SITE. ACTUAL LOCATIONS OF ALL EQUIPMENT, PIPING, DUCTWORK, ETC., AND ALL DEVIATIONS OF THE WORK FROM THAT SHOWN ON THE CONTRACT DOCUMENTS SHALL BE MARKED ON THE RECORD/COORDINATION DRAWINGS. EACH TRADE SHALL REVIEW THE COORDINATION DRAWINGS AND RESOLVE ANY POTENTIAL CONFLICTS WITH OTHER TRADES PRIOR TO INSTALLING ANY PORTION OF THEIR WORK. CONTRACTOR SHALL NOT CORE, DRILL, OR CUT CONCRETE SLABS FOR ANY REASON WITHOUT THE KNOWLEDGE AND WRITTEN CONSENT OF THE COUNTY.
- THE INFORMATION PROVIDED IN THESE DRAWING IS MEANT TO SHOW DESIGN INTENT ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING THE NECESSARY MODIFICATIONS TO MEET ACTUAL FIELD CONDITIONS. THESE MODIFICATIONS SHALL BE APPROVED BY THE COUNTY AND INDICATED ON THE AS-BUILT DRAWINGS.
- CONTRACTOR SHALL REMOVE ALL DEMOLISHED EQUIPMENT, WASTE MATERIAL, DEBRIS, AND RUBBISH FROM SITE AND LEGALLY DISPOSE OF IT IN ACCORDANCE WITH APPLICABLE LOCAL AND ENVIRONMENTAL REGULATIONS.
- CONTRACTOR SHALL ACCOMPANY THE COUNTY FOR INSPECTION AND APPROVAL AT PROJECT COMPLETION.
- CONTRACTOR SHALL MAKE ALL FINAL EQUIPMENT CONNECTIONS AND PROVIDE THE NECESSARY DEVICES, ETC. FOR A COMPLETE AND OPERABLE SYSTEM. COORDINATE REQUIREMENTS FOR PROVISION OF MOTOR STARTERS, DISCONNECTS, CONTACTORS, CONTROL WIRING, ETC. AS REQUIRED FOR PROPER FUNCTIONING WITH THE MECHANICAL AND CONTROL SYSTEMS.
- ARRANGE CONDUIT, WIRING, EQUIPMENT AND OTHER WORK GENERALLY AS SHOWN, PROVIDING PROPER CLEARANCE AND ACCESS. CAREFULLY EXAMINE ALL CONTRACT DRAWINGS AND COORDINATE THE WORK WITH COUNTY.
- THE CONTRACT DRAWINGS ARE DIAGRAMMATIC. ALL OFFSETS, BENDS, FITTINGS AND ACCESSORIES ARE NOT NECESSARILY SHOWN. PROVIDE ALL SUCH ITEMS AS REQUIRED FOR COMPLETE OPERATIONAL SYSTEM.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND CERTIFICATES OF INSPECTION REQUIRED BY THE COUNTY.
- COST INCURRED FROM DAMAGES AS A RESULT OF THE CONTRACTOR'S WORK WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. DAMAGES WILL NOT WARRANT COST OR DELAY CLAIMS.
- THE CONTRACTOR SHALL VISIT THE SITE AND FIELD VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING WORK. ROUTINGS SHOWN ON DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL VERIFY THAT INTERFERENCES WILL NOT BE ENCOUNTERED. IF ANY DISCREPANCY IS DETECTED, THE CONTRACTOR SHALL BRING IT TO THE OWNER'S ATTENTION WITH RECOMMENDATIONS FOR OWNER'S APPROVAL.
- ALL WORK SHALL BE GUARANTEED FOR ONE YEAR AGAINST FAULTY LABOR, MATERIALS AND WORKMANSHIP. TIME FOR GUARANTEE SHALL BEGIN FROM THE DATE OF ACCEPTANCE OF THE COMPLETED WORK BY THE OWNER OR APPOINTED REPRESENTATIVE.
- PROVIDE AND UTILIZE NECESSARY SAFETY EQUIPMENT WHEN WORKING WITH EXISTING, ENERGIZED ELECTRICAL EQUIPMENT.
- TEST ALL ELECTRICAL CONNECTIONS AND COMPONENTS PRIOR TO ENERGIZING SYSTEM AND CORRECT ALL DEFICIENCIES IDENTIFIED.
- ALL CONDUCTORS SHALL BE COPPER, TYPE THHN, XHHW OR AS REQUIRED PER NEC, MINIMUM SIZE #12. PROVIDE A FULL SIZE NEUTRAL CONDUCTOR AND EQUIPMENT GROUND FOR EACH BRANCH CIRCUIT AND FEEDER, UNO.
- CONTRACTOR SHALL REMOVE AND REINSTALL OR RELOCATE ANY MOVEABLE OBSTRUCTIONS THAT MAY IMPEDE WORK UNDER THIS CONTRACT, AT NO ADDITIONAL COST. THESE SHALL INCLUDE, BUT ARE NOT LIMITED TO EQUIPMENT, PIPING, ANY SUPPORTING APPURTENANCES, CONDUIT ROUTINGS, HVAC DUCTS, ETC. ANY CONSTRUCTION REQUIRING WORK AS STATED, SHALL BE RECONNECTED AFTER THE END OF CONSTRUCTION TO PROVIDE A FULLY FUNCTIONAL SYSTEM(S), AS FOUND PRIOR TO COMMENCING CONTRACT WORK. CONTRACTOR SHALL PROVIDE A TRAILER FOR DAILY WORK.

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 42043 EXPIRATION DATE: 01/11/2022



ELECTRICAL ABBREVIATIONS

ABBR.	DESCRIPTION	ABBR.	DESCRIPTION
A	- AMPERE	MAX	- MAXIMUM
ACI	- AMERICAN CONCRETE INSTITUTE	MC	- MECHANICAL CONTRACTOR
AFF	- ABOVE FINISHED FLOOR	MEP	- MECHANICAL, ELECTRICAL, AND PLUMBING
AFG	- ABOVE FINISHED GRADE	MH	- MOUNTING HEIGHT
AHJ	- AUTHORITY HAVING JURISDICTION	MIN	- MINIMUM, MINUTE
AIC	- AMPERE INTERRUPTING CAPACITY	MCD	- MOTORIZED OPERATED DAMPER
ANSI	- AMERICAN NATIONAL STANDARDS INSTITUTE	MOV	- MOTORIZED OPERATED VALVE
APPROX	- APPROXIMATE	MS	- MAIN SWITCHGEAR, MOTOR STARTER
AUX	- AUXILIARY	MTD	- MOUNTED
AVG	- AVERAGE	MTR	- MOTOR
AWG	- AMERICAN WIRE GAUGE	-N-	- NEW
BOT	- BOTTOM	NEC	- NATIONAL ELECTRICAL CODE
C	- CENTERLINE	NC	- NORMALLY CLOSED, NOISE CRITERIA
C	- CONDUIT	NEMA	- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
CB	- CIRCUIT BREAKER	NF	- NON-FUSED
CKT	- CIRCUIT	NFPA	- NATIONAL FIRE PROTECTION ASSOCIATION
COMPR	- COMPRESSOR	NFSS	- NON-FUSED SAFETY SWITCH
CR	- CONTROL RELAY	NO	- NORMALLY OPEN, NUMBER
DB	- DIRECT BURIED, DRY BULB	NTS	- NOT TO SCALE
DIA	- DIAMETER	OC	- ON CENTER
DISC	- DISCONNECT	OH	- OVERHEAD
DN	- DOWN	OSHA	- OCCUPATIONAL SAFETY AND HEALTH ASSOCIATION
DWG	- DRAWING	OZ	- OUNCE
EC	- ELECTRICAL CONTRACTOR	P	- PHASE, PUMP
EF	- EXHAUST FAN	PH	- PHASE
EMT	- ELECTRICAL METALLIC TUBING	PNL	- PANEL
ENT	- ENTERING	POC	- POINT OF CONNECTION
ETR	- EXISTING TO REMAIN	PVC	- POLYVINYLCHLORIDE DUCT (SIZE NOTED)
EUH	- ELECTRIC UNIT HEATER	QTY	- QUANTITY
EWT	- ENTERING WATER TEMPERATURE	RGS	- RIGID GALVANIZED STEEL
EX	- EXISTING	RX	- REMOVE EXISTING
FDR	- FEEDER	SCH	- SCHEDULE
FLA	- FULL LOAD AMPS	SECT	- SECTION
FSS	- FUSED SAFETY SWITCH	SST	- STAINLESS STEEL
FT	- FEET	STL	- STEEL
G, GND,	- GROUND	SPD	- SURGE PROTECTION DEVICE
GRD, GRN		SW	- SWITCH, SOCKET WELD
GA	- GAGE GAUGE	SYM	- SYMMETRICAL
GALV	- GALVANIZED	THK	- THICKNESS
GE	- GENERAL ELECTRIC	TYP	- TYPICAL
GEC	- GROUNDING ELECTRODE CONDUCTOR	UDS	- UTILITY DISTRIBUTION SYSTEM
GFI	- GROUND FAULT INTERRUPTING	UF	- UNDERLOOR
GFCI	- GROUND FAULT CURRENT INTERRUPTING	UG	- UNDERGROUND
H-O-A	- HAND-OFF-AUTOMATIC SWITCH	UL	- UNDERWRITERS LABORATORIES, INC.
HP	- HEAT PUMP, HORSE POWER	UNON	- UNLESS OTHERWISE NOTED
HVAC	- HEATING, VENTILATION, AND AIR CONDITIONING	VA	- VOLT AMPERE
HZ	- HERTZ	W	- WIRE, WATT
JB	- JUNCTION BOX	W/	- WITH
KCM	- THOUSAND CIRCULAR MILS	WP	- WEATHERPROOF EQUIPMENT
KVA	- KILOVOLT AMPERES	XFMR	- TRANSFORMER
KW	- KILOWATT		
LF	- LINEAR FEET		
LG	- LENGTH		

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	LIGHTING FIXTURES, SEE LIGHT FIXTURE SCHEDULE		DUPLEX RECEPTACLE, 20A, NEMA 5-20R
	EXIT SIGN, SEE LIGHT FIXTURE SCHEDULE		DUPLEX RECEPTACLE, 20A, NEMA 5-20R GFI: GROUND FAULT CIRCUIT INTERRUPTER
	EMERGENCY LIGHTING UNIT, SEE LIGHT FIXTURE SCHEDULE		JUNCTION BOX, CEILING OR WALL MOUNTED
	REMOTE LAMP HEADS AND BATTERY, SEE LIGHT FIXTURE SCHEDULE		WELDING RECEPTACLE
	HOMERUN TO PANELBOARD: DESIGNATION INDICATES PANEL AND CIRCUIT NUMBER		277/480V PANELBOARD
	SINGLE POLE, 20A, 120/277V TOGGLE TYPE LIGHT SWITCH		120/208V PANELBOARD
	THREE WAY, 20A, 120/277V TOGGLE TYPE LIGHT SWITCH		GENERATOR E-STOP BUTTON
	FOUR WAY, 20A, 120/277V TOGGLE TYPE LIGHT SWITCH		GENERATOR AUDIBLE/VISUAL ANNUCIATOR
	MANUAL MOTOR STARTER TOGGLE SWITCH WITH THERMAL OVERLOAD ELEMENT. VOLTAGE RATING IN ACCORDANCE WITH EQUIPMENT SERVED		SURGE PROTECTION DEVICE
	GROUND CONNECTION		GENERATOR
	DISCONNECT SWITCH, TYPE AS NOTED		AUTOMATIC TRANSFER SWITCH
	MOTORIZED EQUIPMENT		CIRCUIT BREAKER
	CURRENT TRANSFORMER CONNECTION		FUSED DISCONNECT SWITCH
			DELTA WYE TRANSFORMER

MOUNTING HEIGHT SCHEDULE

RECEPTACLES	18" ABOVE FINISHED FLOOR
LIGHT SWITCHES	48" ABOVE FINISHED FLOOR
PANELBOARDS	TOP OF PANEL TO BE 72" ABOVE FINISHED FLOOR
LIGHT FIXTURES	SEE LIGHT FIXTURE SCHEDULE

• UNLESS INDICATED OTHERWISE, DEVICE MOUNTING HEIGHTS ARE TO CENTER LINE OF DEVICE
• MOUNTING HEIGHTS OF ALL DEVICES SHALL COMPLY WITH ICC/ANSI A117.1-2003

AS-BUILT
DATE 12/2021

E-0

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE 2/5/17

CHIEF, BUREAU OF UTILITIES DATE 2/13/17

CHIEF, UTILITY DESIGN DIVISION DATE 2/13/17

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ROBERT WILLIAMS
PROFESSIONAL ENGINEER

DES: SB				
DRN: SB				
CHK: BRM	JFW	ELECTRICAL DESIGN UPDATES	6/20	
DATE:	JFW	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20	
AUG, 2016	BY NO.	REVISION	DATE	

ELECTRICAL GENERAL
NOTES, SYMBOLS
AND ABBREVIATIONS

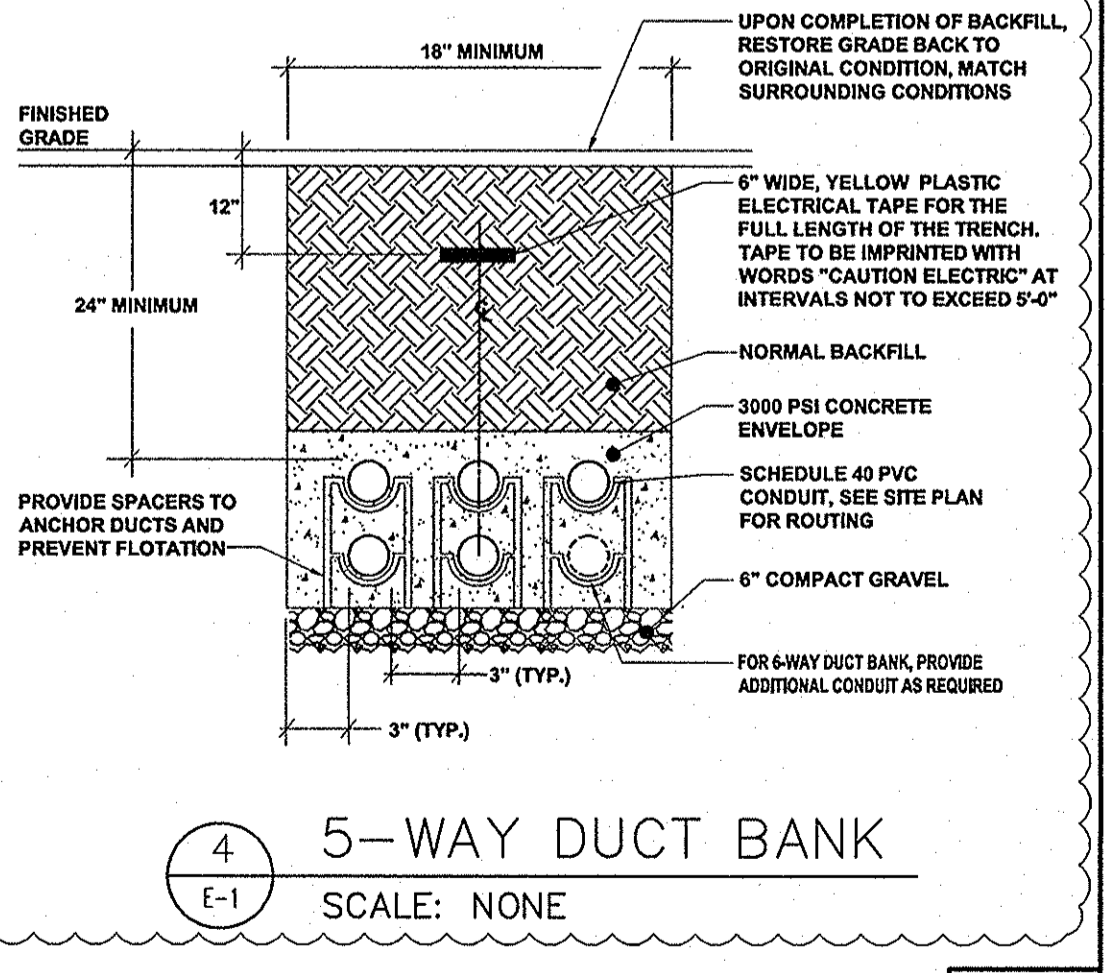
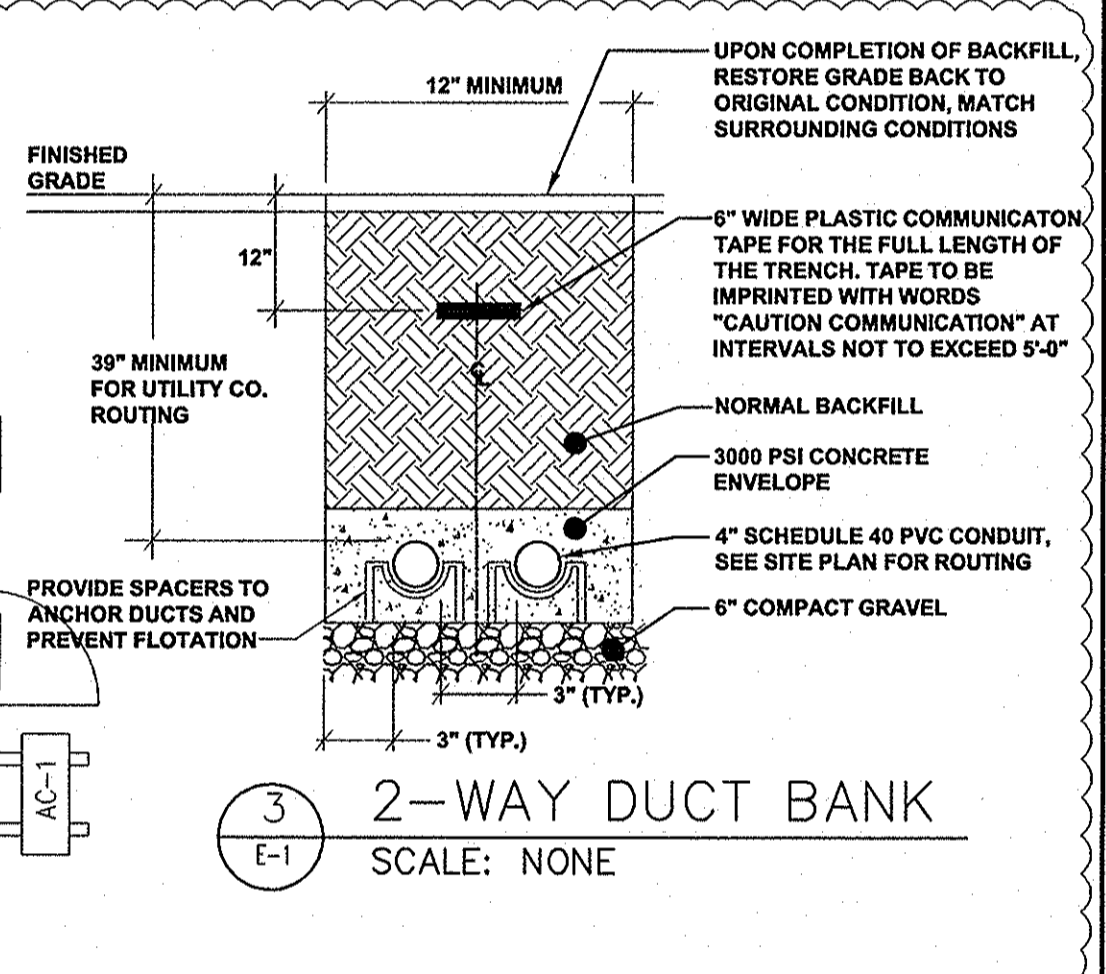
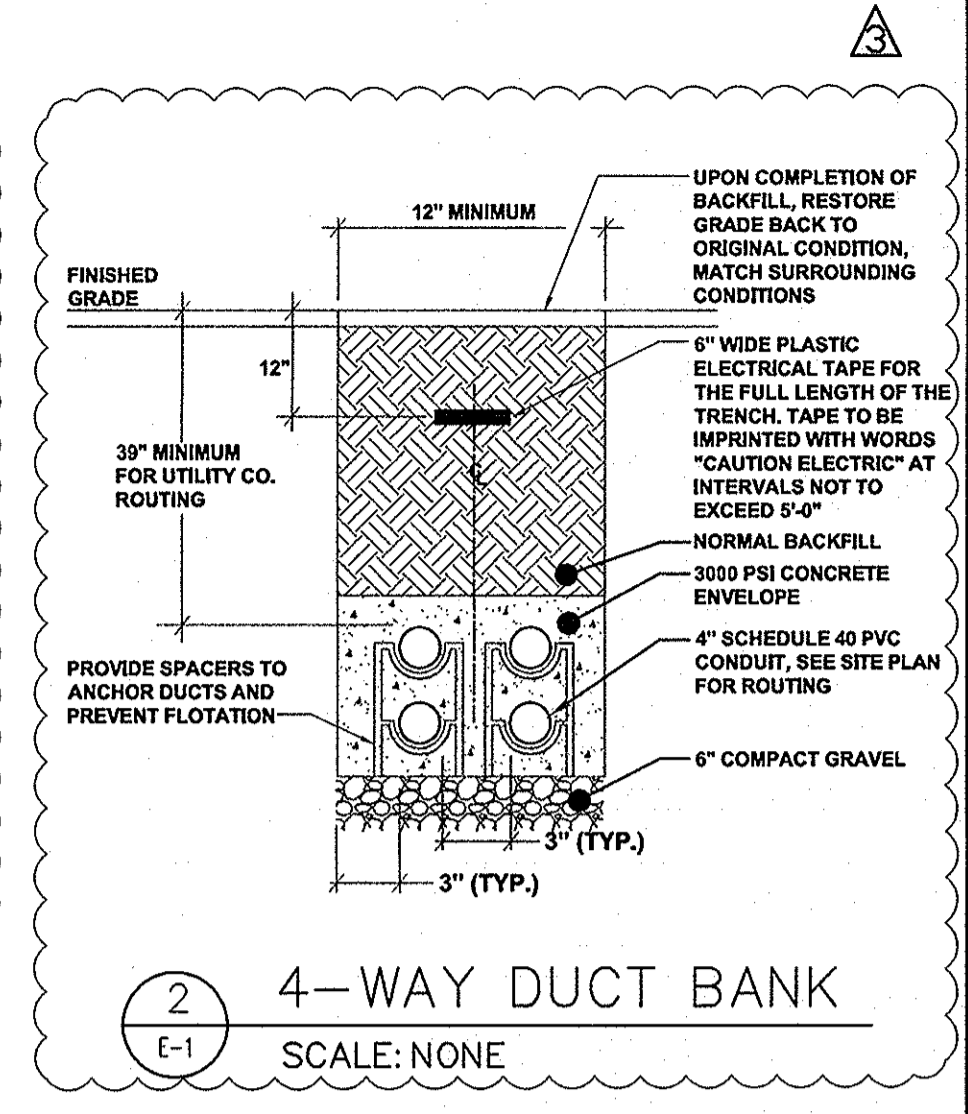
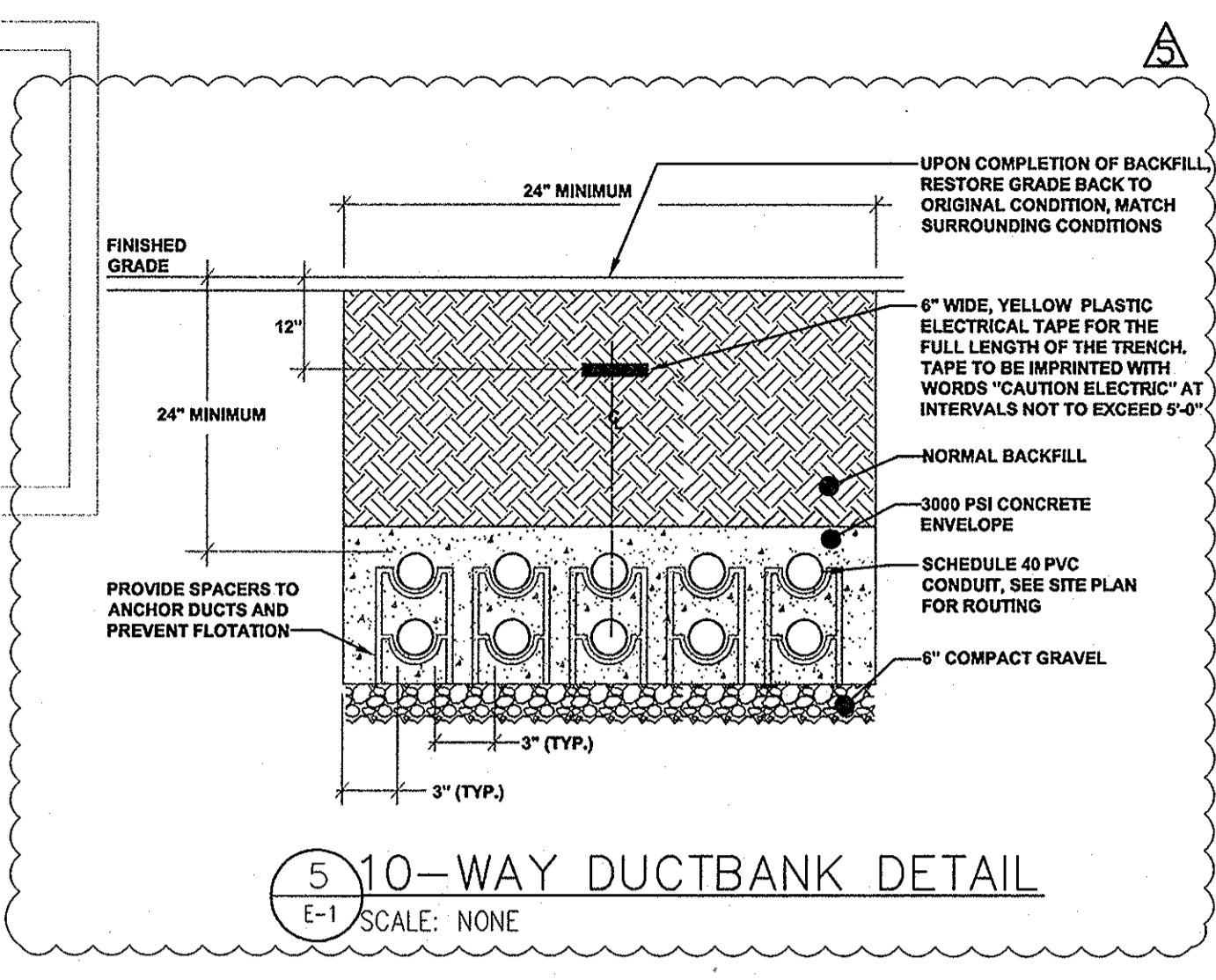
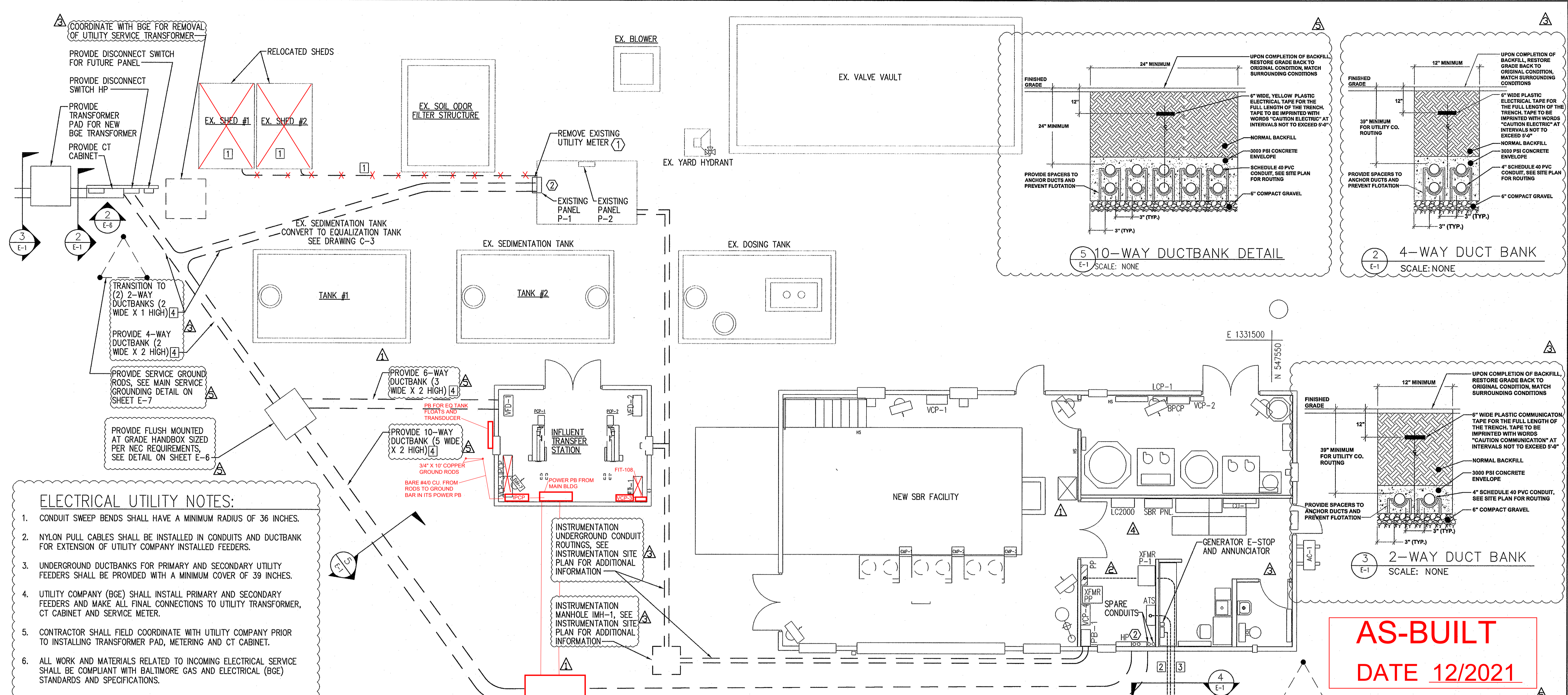
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE
AS SHOWN
SHEET
24 OF 43



ELECTRICAL UTILITY NOTES:

1. CONDUIT SWEEP BENDS SHALL HAVE A MINIMUM RADIUS OF 36 INCHES.
2. NYLON PULL CABLES SHALL BE INSTALLED IN CONDUITS AND DUCTBANK FOR EXTENSION OF UTILITY COMPANY INSTALLED FEEDERS.
3. UNDERGROUND DUCTBANKS FOR PRIMARY AND SECONDARY UTILITY FEEDERS SHALL BE PROVIDED WITH A MINIMUM COVER OF 39 INCHES.
4. UTILITY COMPANY (BGE) SHALL INSTALL PRIMARY AND SECONDARY FEEDERS AND MAKE ALL FINAL CONNECTIONS TO UTILITY TRANSFORMER, CT CABINET AND SERVICE METER.
5. CONTRACTOR SHALL FIELD COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLING TRANSFORMER PAD, METERING AND CT CABINET.
6. ALL WORK AND MATERIALS RELATED TO INCOMING ELECTRICAL SERVICE SHALL BE COMPLIANT WITH BALTIMORE GAS AND ELECTRICAL (BGE) STANDARDS AND SPECIFICATIONS.
7. PRIOR TO ANY CONSTRUCTION FOR THE UNDERGROUND ELECTRICAL SERVICE, CONTRACTOR SHALL CONTACT BGE.

GENERAL ELECTRICAL SITE NOTES:

1. MAINTAIN A MINIMUM VERTICAL CLEARANCE OF 12 INCHES BETWEEN UNDERGROUND ROUTINGS THAT CROSS EACH OTHER.
2. UNLESS NOTED OTHERWISE, ALL EXTERIOR UNDERGROUND CONDUIT ROUTINGS SHALL BE SCHEDULE 40 PVC CONDUIT.
3. UNLESS NOTED OTHERWISE, ALL EXTERIOR ABOVE GRADE EXPOSED CONDUIT ROUTINGS SHALL BE RIGID GALVANIZED STEEL.
4. CONDUITS INSTALLED THROUGH A BUILDING WALL SHALL HAVE INTERNAL AND EXTERNAL SEALANT APPLIED. SEE WALL PENETRATION DETAIL ON SHEET E-7 FOR ADDITIONAL INFORMATION.
5. SEE SHEETS I-3 AND C-3 FOR ADDITIONAL UNDERGROUND CONDUIT ROUTINGS FROM SEDIMENT TANKS TO INFLUENT TRANSFER STATION.
6. PROVIDE A MINIMUM BURIAL DEPTH OF 24\"/>

DEMOLITION KEYED NOTES:

- 1 REMOVE EXISTING METER CABINET. COORDINATE REMOVAL WITH INSTALLATION OF NEW FEEDER TO EXISTING PANEL P-1 TO MINIMIZE OUTAGE. ABANDON EXISTING CONDUITS IN PLACE. DELIVER METER TO UTILITY COMPANY.
- 2 EXISTING PANEL P-1 SHALL BE FED FROM NEW PANEL HP THROUGH 75 KVA TRANSFORMER SEE PANEL SCHEDULE ON DRAWING E-4 AND ONE LINE DIAGRAM ON DRAWING E-5 FOR ADDITIONAL INFORMATION AND REQUIREMENTS. ALL WORK SHALL BE PERFORMED DURING NIGHT TIME (PREMIUM TIME) TO MINIMIZE THE DISRUPTION TO THE EXISTING DRAIN FIELD.

NEW WORK KEYED NOTES:

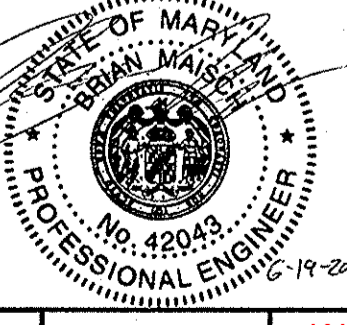
- 1 PROVIDE A NEW FEEDER FROM THE EXISTING PANEL P-1 TO POWER THE RELOCATED SHEDS. REFER TO DRAWING E-5 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- 2 PROVIDE (2) 3/4\"/>

PROVIDE NEW 250KW, 130°C RISE, 277/480V, 3Ø, 4W GENERATOR WITH INTEGRAL 100% RATED 400A/3P BREAKER, DIESEL SUB BASE FUEL TANK, SEE GENERATOR GROUNDING DETAIL ON SHEET E-7

NEW CONCRETE PAD, SEE STRUCTURAL DRAWING FOR ADDITIONAL INFORMATION

COUNTERPOISE GROUNDING FOR PANEL HP. SEE ONE LINE DIAGRAM FOR ADDITIONAL INFORMATION

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42043, EXPIRATION DATE: 01/11/2022



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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Robert Williams 2/17/21
 DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Butler 2/17/21
 CHIEF, BUREAU OF ENGINEERING DATE

Robert Williams 2/17/21
 CHIEF, BUREAU OF UTILITIES DATE

Thomas E. Butler 2/17/21
 CHIEF, UTILITY DESIGN DIVISION DATE

DES:	KJ	AS-BUILT	12/21
DRN:	JFW	ELECTRICAL DESIGN UPDATES	6/20
CHK:	JFW	RFI #002	6/20
DATE:	JFW	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20
AUG, 2016	JFW	ADDENDUM 1	6/20
BY:	GW	NOVEMBER 21, 2018	
NO.	NO.	REVISION	DATE

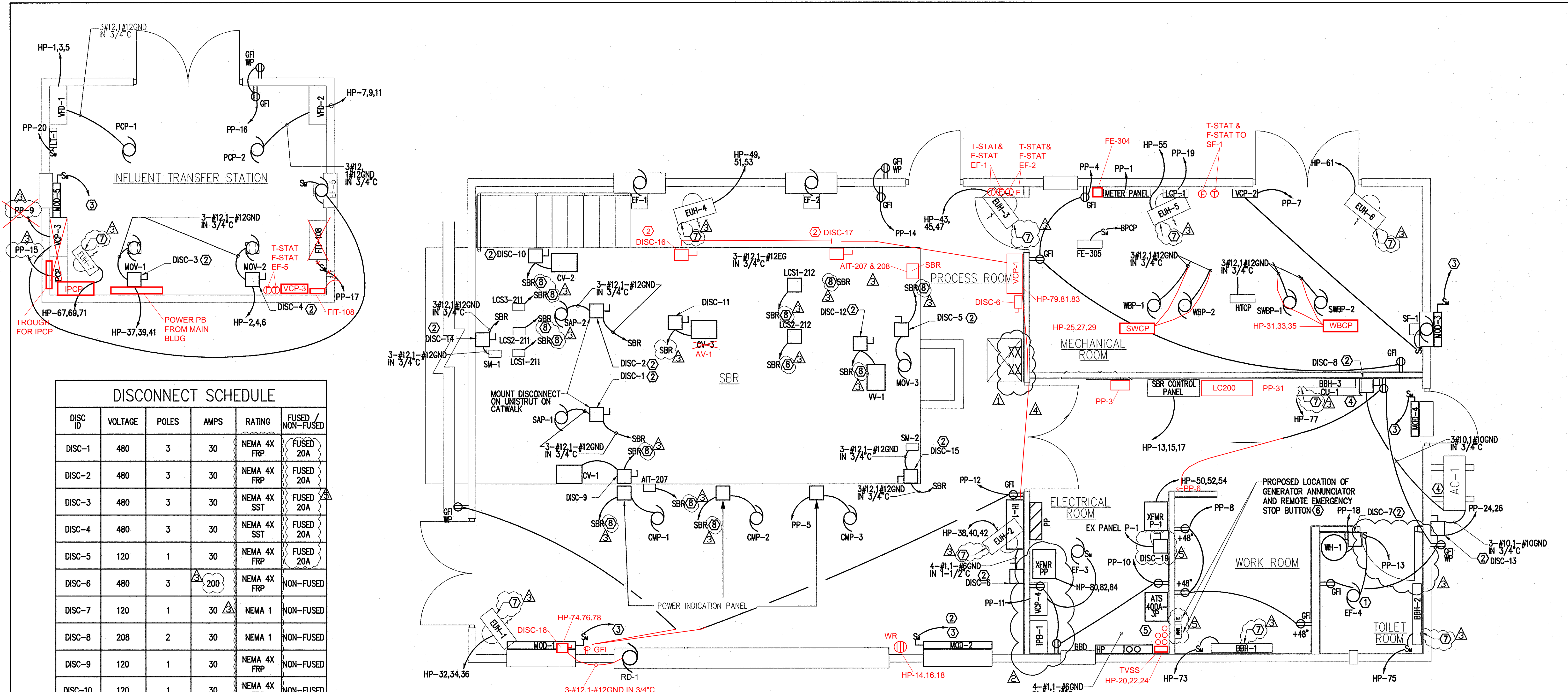
ELECTRICAL SITE PLAN

60' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 25 OF 43

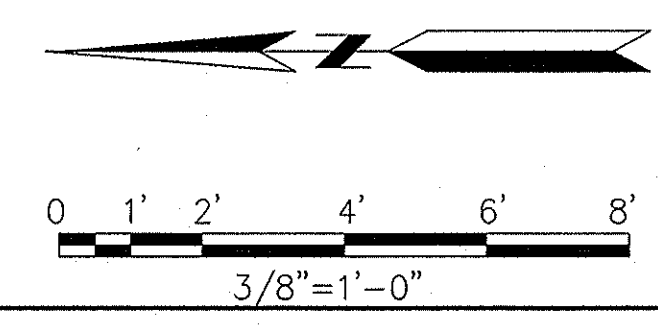
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DISCONNECT SCHEDULE					
DISC ID	VOLTAGE	POLES	AMPS	RATING	FUSED / NON-FUSED
DISC-1	480	3	30	NEMA 4X FRP	FUSED 20A
DISC-2	480	3	30	NEMA 4X FRP	FUSED 20A
DISC-3	480	3	30	NEMA 4X SST	FUSED 20A
DISC-4	480	3	30	NEMA 4X SST	FUSED 20A
DISC-5	120	1	30	NEMA 4X FRP	FUSED 20A
DISC-6	480	3	200	NEMA 4X FRP	NON-FUSED
DISC-7	120	1	30	NEMA 1	NON-FUSED
DISC-8	208	2	30	NEMA 1	NON-FUSED
DISC-9	120	1	30	NEMA 4X FRP	NON-FUSED
DISC-10	120	1	30	NEMA 4X FRP	NON-FUSED
DISC-11	120	1	30	NEMA 4X FRP	NON-FUSED
DISC-12	120	1	30	NEMA 4X FRP	NON-FUSED
DISC-13	208	2	30	NEMA 4X SST	FUSED 25A
DISC-14	480	3	30	NEMA 4X FRP	NON-FUSED
DISC-15	480	3	30	NEMA 4X FRP	NON-FUSED
DISC-16	480	3	30	NEMA 4X FRP	FUSED 20A
DISC-17	480	3	30	NEMA 4X FRP	FUSED 20A
DISC-18	480	3	30	NEMA 4X FRP	FUSED 20A
DISC-19	208	3	300	NEMA 1	FUSED 225A

ELECTRICAL POWER BUILDING LAYOUT SCALE: 3/8" = 1'-0" **AS-BUILT REPLACEMENT SHEET 12/2021**

- GENERAL NOTES:**
- SHEET E-0 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
 - ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE ALL ELECTRICAL INSTALLATIONS WITH ALL DISCIPLINES.
 - IN ACCORDANCE WITH NEC 358.26, THERE SHALL BE NO MORE THAN A TOTAL OF 360 DEGREES ON BENDS IN A CONDUIT ROUTING BETWEEN PULL POINTS (BOXES).
 - AT EACH DISCONNECT SWITCH AND CONTROL ENCLOSURE, PROVIDE NAME PLATE DATA REFLECTING PANEL SOURCE AND CIRCUIT NUMBER.
- KEYED NOTES:**
- CONNECT EXHAUST FAN EF-4 TO NEAREST SWITCH VIA A RELAY.
 - SEE DISCONNECT SCHEDULE FOR SIZING INFORMATION.
 - 2#12,1#12G -3/4"C. TO VCP CONTROL PANEL.
 - CU-1 SHALL BE FED FROM AC-1. PROVIDE WIRING IN CONDUIT AS PER MANUFACTURER'S RECOMMENDATION.
 - PROVIDE A 200A FRAME, 125A FUSED DISCONNECT SWITCH TO FED THE EQUIPMENT IH-1. PROVIDE A JUNCTION BOX AS NECESSARY TO TAP THE NORMAL FEEDER ENTERING THE BUILDING PRIOR TO NORMAL LUGS OF THE TRANSFER SWITCH. REFER TO ONE LINE DIAGRAM ON DRAWING E-5 FOR ADDITIONAL INFORMATION.
 - REMOTE EMERGENCY-STOP SWITCH: FLUSH, WALL MOUNTED UNLESS OTHERWISE INDICATED; AND LABELED. PUSH BUTTON SHALL BE PROTECTED FROM ACCIDENTAL OPERATION.
 - EQUIPMENT PROVIDED WITH INTEGRAL DISCONNECT SWITCH.
 - REFER TO INSTRUMENTATION DRAWINGS FOR CONDUIT AND WIRE QUANTITY AND SIZES.



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42043. EXPIRATION DATE: 01/11/2022

STATE OF MARYLAND
BRUNN WASHINGTON
PROFESSIONAL ENGINEER
No. 42043
01-19-20

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/17
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/17
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/17
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DES: SB KJ AS-BUILT 12/21
ELECTRICAL DESIGN UPDATES 6/20

DRN: SB JFW RFI #002 6/20
BUILDING PERMIT COMMENTS - HO. CO. DILP 6/20

CHK: BRM JFW ADDENDUM 1 6/20
NOVEMBER 21, 2018

DATE: AUG, 2016 BY NO. REVISION DATE 600' SCALE MAP NO. 40-41 BLOCK NO. 12

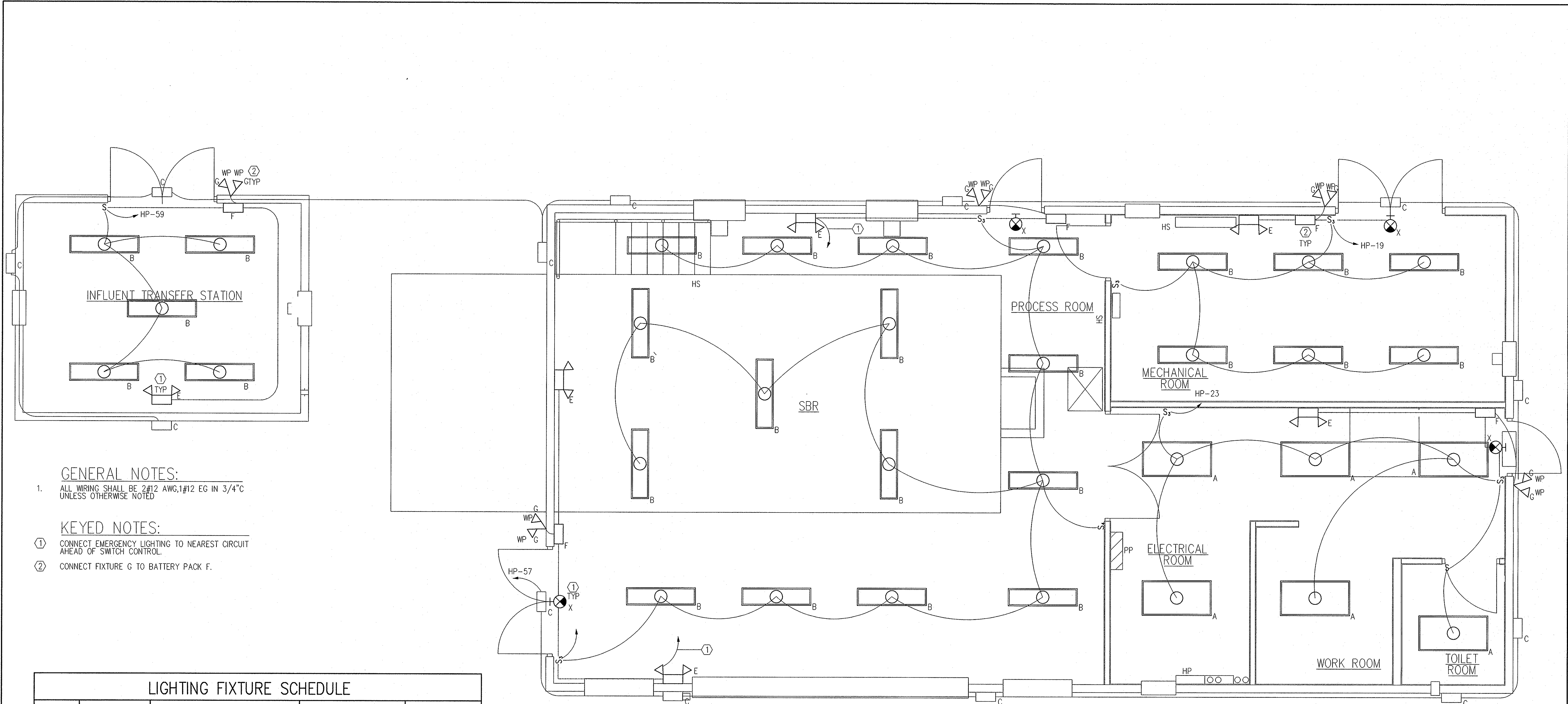
ELECTRICAL POWER BUILDING LAYOUT

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 26 OF 43



GENERAL NOTES:

- 1. ALL WIRING SHALL BE 2#12 AWG, 1#12 EG IN 3/4" C UNLESS OTHERWISE NOTED

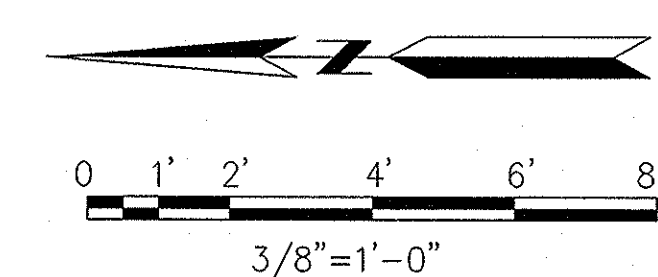
KEYED NOTES:

- ① CONNECT EMERGENCY LIGHTING TO NEAREST CIRCUIT AHEAD OF SWITCH CONTROL.
- ② CONNECT FIXTURE G TO BATTERY PACK F.

LIGHTING FIXTURE SCHEDULE

FIXTURE ID	LAMP(S)	DESCRIPTION	MANUFACTURER AND CATALOG NUMBER	MTD
A	(3) 32-WATT FLUORESCENT T8	2'X4' RECESSED, 3 LAMP, A12 LENS, ELECTRONIC BALLAST	LITHONIA 28PB G 3 32 A12 277/1/3 GEB10IS	9'-0" GRID MTD
B	(2) 32-WATT FLUORESCENT T8	4' WET LOCATION ENCLOSURE 2 LAMP 50% DR HIGH ACRYLIC LENS	LITHONIA DMW 2 32 277 GEB10IS	13'-0" AFF PENDANT MTD
C	LED	WALL MOUNTED EXTERIOR BUILDING LIGHT WITH INTEGRAL PHOTOCELL	LITHONIA TWPLED 10C 700 50K T3M 277 PE DDBXD	9'-0" AFG WALL MTD
E	(2) 12-WATT INCANDESCENT	EMERGENCY LIGHTING WITH BATTERY BACKUP	LITHONIA TITAN ELT125 H1212 TD	13'-0" AFF WALL MTD
F	NONE	BATTERY PACK FOR REMOTE HEADS	LITHONIA TITAN ELT125 RO TD	13'-0" AFF WALL MTD
G	(1) 12V 12-WATT PAR36	EMERGENCY REMOTE HEAD	LITHONIA ELA T MX H1212	9'-0" AFG WALL MTD
X	RED LED	RED LED EXIT SIGN WITH BATTERY BACKUP	LITHONIA EXR LED EL M6	10'-0" AFF WALL MTD

ELECTRICAL LIGHTING BUILDING LAYOUT
SCALE: 3/8" = 1'-0"



AS-BUILT
DATE 12/2021

PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42043 EXPIRATION DATE: 01/11/2022



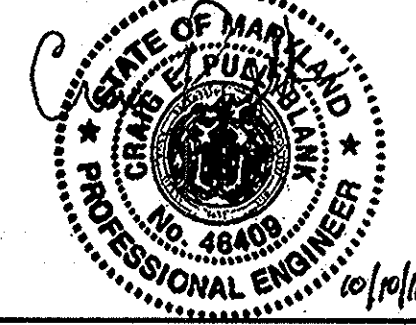
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James E. Butler 2/17
CHIEF, BUREAU OF ENGINEERING
DATE

James E. Butler 2/17
CHIEF, UTILITY DESIGN DIVISION
DATE

KCI TECHNOLOGIES
ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS
936 RIDGEBROOK ROAD
SHARPS, MARYLAND 21152
TELEPHONE (410) 316-7800
FAX (410) 316-7818
WWW.KCI.COM



DES:	SB			
DRN:	SB	JFW	RFI #002	6/20
CHK:	BRM	JFW	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20
DATE:	SW	JFW	ADDENDUM 1	6/20
BY	NO.	SW	NOVEMBER 21, 2018	
			REVISION	DATE

ELECTRICAL LIGHTING BUILDING LAYOUT

600' SCALE MAP NO. 40-41 BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

E-3
SCALE AS SHOWN
SHEET
27 OF 43

NEW PANEL HP

POLES 42 SECTION 1 AIC 22,000		VOLTAGE 480 /277 VOLTS BUS 400A MAIN 400A MAIN CIRCUIT BREAKER WIRE 4 WIRE (A, B, C, N, G)			MOUNTING LOCATION PHASE 3 SURFACE ELEC RM			FED FROM SERVICE DISCONNECT												
CKT #	BREAKER POLES TRIP	DESCRIPTION	WIRE NO. SIZE	GROUND NO. SIZE	CON. SIZE	PHASE KVA			WIRE NO. SIZE	GROUND NO. SIZE	CON. SIZE	DESCRIPTION	BREAKER POLES TRIP	CKT #						
						A	B	C												
1	3	20	VFD-1, PCP-1	3	10	10	3/4	2.10 0.30	-	-	3	10	10	3/4	MOV-2	3	20	2		
3	-	-	-	-	-	-	-	2.10 0.30	-	-	-	-	-	-	-	-	-	4		
5	-	-	-	-	-	-	-	2.10 0.30	-	-	-	-	-	-	-	-	-	6		
7	3	20	VFD-2, PCP-2	3	10	10	3/4	2.10	-	-	-	-	-	-	SPARE	3	20	8		
9	-	-	-	-	-	-	-	2.10	-	-	-	-	-	-	-	-	-	10		
11	-	-	-	-	-	-	-	2.10	-	-	-	-	-	-	-	-	-	12		
13	3	60	SBR	3	6	1	10	1	5.48 15.00	-	-	3	6	1	10	1	WR-1	3	60	14
15	-	-	-	-	-	-	-	5.48 15.00	-	-	-	-	-	-	-	-	-	16		
17	-	-	-	-	-	-	-	5.48 15.00	-	-	-	-	-	-	-	-	-	18		
19	1	20	MECH RM LIGHTS	2	12	1	12	3/4	0.34	-	-	-	-	-	SPACE	-	-	20		
21	1	20	PROCESS RM LIGHTS	2	12	1	12	3/4	0.85	-	-	-	-	-	SPACE	-	-	22		
23	1	20	ELECT & WORK RM LIGHTS	2	12	1	12	3/4	0.26	-	-	-	-	-	SPACE	-	-	24		
25	3	15	BPCP	3	12	1	12	3/4	3.87	-	-	-	-	-	SPACE	3	20	26		
27	-	-	-	-	-	-	-	3.87	-	-	-	-	-	-	-	-	-	28		
29	-	-	-	-	-	-	-	3.87	-	-	-	-	-	-	-	-	-	30		
31	3	20	SPARE	-	-	-	-	1.67	-	-	3	12	1	12	3/4	EUH-1	3	20	32	
33	-	-	-	-	-	-	-	1.67	-	-	-	-	-	-	-	-	-	34		
35	-	-	-	-	-	-	-	1.67	-	-	-	-	-	-	-	-	-	36		
37	3	20	MOV-1	3	10	1	10	3/4	0.30 1.67	-	-	3	12	1	12	3/4	EUH-2	3	20	38
39	-	-	-	-	-	-	-	0.30 1.67	-	-	-	-	-	-	-	-	-	40		
41	-	-	-	-	-	-	-	0.30 1.67	-	-	-	-	-	-	-	-	-	42		
								32.83	33.34	32.45										
TOTAL CONNECTED KVA								98.62			TOTAL AMPS:		118.62							

NEW PANEL HP

POLES 42 SECTION 2 AIC 22,000		VOLTAGE 480 /277 VOLTS BUS 400A MAIN 400A MAIN LUGS ONLY WIRE 4 WIRE (A, B, C, N, G)			MOUNTING LOCATION PHASE 3 SURFACE ELEC RM			FED FROM PANEL HP, SECTION 1												
CKT #	BREAKER POLES TRIP	DESCRIPTION	WIRE NO. SIZE	GROUND NO. SIZE	CON. SIZE	PHASE KVA			WIRE NO. SIZE	GROUND NO. SIZE	CON. SIZE	DESCRIPTION	BREAKER POLES TRIP	CKT #						
						A	B	C												
43	3	20	EUH-3	3	12	1	12	3/4	1.67	-	-	SPARE	3	20	44					
45	-	-	-	-	-	-	-	-	1.67	-	-	-	-	-	46					
47	-	-	-	-	-	-	-	-	1.67	-	-	-	-	-	48					
49	3	20	EUH-4	3	12	1	12	3/4	1.67 15.00	-	-	3	1	1	6	1-1/2	75KVA XFMR-2, P-1	3	125	50
51	-	-	-	-	-	-	-	-	1.67 15.00	-	-	-	-	-	-	-	-	-	-	52
53	-	-	-	-	-	-	-	-	1.67 15.00	-	-	-	-	-	-	-	-	-	-	54
55	1	20	EUH-5	2	12	1	12	3/4	3.00	-	-	SPARE	1	20	56					
57	1	20	EXTERIOR LIGHTS	2	10	1	10	3/4	1.76	-	-	SPARE	1	20	58					
59	1	20	UTILITY LIGHTS (ITS BLDG)	2	10	1	10	3/4	0.28	-	-	SPACE	-	-	60					
61	1	20	EUH-6	2	12	1	12	3/4	3.00	-	-	SPACE	-	-	62					
63	-	-	SPACE	-	-	-	-	-	-	-	-	SPACE	-	-	64					
65	-	-	SPACE	-	-	-	-	-	-	-	-	SPACE	1	20	66					
67	3	20	EUH-7	3	10	1	10	3/4	1.67	-	-	SPACE	3	20	68					
69	-	-	-	-	-	-	-	-	1.67	-	-	-	-	-	70					
71	-	-	-	-	-	-	-	-	1.67	-	-	-	-	-	72					
73	1	20	BBH-1	2	12	1	12	3/4	1.00 0.30	-	-	3	12	1	12	3/4	RD-1 ROLL UP DOOR	3	20	74
75	1	20	BBH-2	2	12	1	12	3/4	1.00 0.30	-	-	-	-	-	-	-	-	-	-	76
77	1	20	BBH-3	2	12	1	12	3/4	1.00 0.30	-	-	-	-	-	-	-	-	-	-	78
79	3	20	VCP-1	3	12	1	12	3/4	0.70 4.69	-	-	3	12	1	12	3/4	30KVA XFMR-1, PP	3	50	80
81	-	-	-	-	-	-	-	-	0.70 4.84	-	-	-	-	-	-	-	-	-	-	82
83	-	-	-	-	-	-	-	-	0.70 8.10	-	-	-	-	-	-	-	-	-	-	84
								32.70	28.61	30.39										
TOTAL CONNECTED KVA								91.70			TOTAL AMPS:		110.30							

NEW PANEL PP

POLES 42 SECTION - AIC 22,000		VOLTAGE 208 /120 VOLTS BUS 100A MAIN 100A MAIN CIRCUIT BREAKER WIRE 4 WIRE (A, B, C, N, G)			MOUNTING LOCATION PHASE 3 SURFACE ELEC RM			FED FROM PANEL HP VIA XFMR-1												
CKT #	BREAKER POLES TRIP	DESCRIPTION	WIRE NO. SIZE	GROUND NO. SIZE	CON. SIZE	PHASE KVA			WIRE NO. SIZE	GROUND NO. SIZE	CON. SIZE	DESCRIPTION	BREAKER POLES TRIP	CKT #						
						A	B	C												
1	1	20	METER PANEL	2	12	1	12	3/4	0.12	-	-	SPACE	-	-	2					
3	1	20	SPARE	-	-	-	-	-	0.54	-	-	2	12	1	12	3/4	MECH RM RECEPT	1	20	4
5	1	20	CMP-3	2	12	1	12	3/4	0.12 0.72	-	-	2	12	1	12	3/4	WORK RM & AC-1 RECEPT	1	20	6
7	1	20	VCP-2	2	12	1	12	3/4	0.05 0.54	-	-	2	12	1	12	3/4	WORK RM RECEPT	1	20	8
9	1	20	VCP-3	2	10	1	10	3/4	0.73 0.54	-	-	2	12	1	12	3/4	ELECT. RM RECEPT	1	20	10
11	1	20	VCP-4	2	12	1	12	3/4	0.05 0.54	-	-	2	12	1	12	3/4	PROCESS RM RECEPT	1	20	12
13	1	20	EF-4	2	12	1	12	3/4	0.60 0.28	-	-	2	12	1	12	3/4	PROCESS RM & EXT RECEPT	1	20	14
15	1	20	IPCP	2	10	1	10	3/4	0.25 0.36	-	-	2	10	1	10	3/4	IFS RECEPT	1	20	16
17	1	20	FIT-108	2	10	1	10	3/4	0.25 1.60	-	-	2	12	1	12	3/4	WH-1	1	20	18
19	1	20	LCP-1	2	12	1	12	3/4	0.40 0.18	-	-	2	12	1	12	3/4	LT-1	1	20	20
21	1	20	GEN STRIP HEATER	2	10	1	10	3/4	1.20	-	-	SPARE	1	20	22					
23	1	20	GEN BATTERY CHARGER	2	10	1	10	3/4	1.20 2.40	-	-	2	10	1	10	3/4	AC-1	2	25	24
25	1	20	SPARE	-	-	-	-	-	2.40	-	-	-	-	-	-	-	-	-	-	26
27	2	20	GEN BLOCK HEATER	2	10	1	10	3/4	1.22	-	-	SPARE	1	20	28					
29	-	-	-	-	-	-	-	-	1.22	-	-	SPARE	1	20	30					
31	1	20	LC2000	2	12	1	12	3/4	0.12	-	-	SPARE	1	20	32					
33	1	20	SPARE	2	12	1	12	3/4	-	-	-	SPARE	1	20	34					
35	1	20	SPARE	2	10	1	10	3/4	-	-	-	SPARE	1	20	36					
37	1	20	SPARE	2	10	1	10	3/4	-	-	-	SPARE	1	20	38					
39	-	-	SPACE	2	12	1	12	3/4	-	-	-	SPACE	-	-	40					
41	-	-	SPACE	2	12	1	12	3/4	-	-	-	SPACE	-	-	42					
								4.69	4.84	8.10										
TOTAL CONNECTED KVA								17.63			TOTAL AMPS:		48.9							

GENERAL NOTES:

- PROVIDE TYPED WRITTEN SCHEDULES FOR PANELBOARD CIRCUITS.
- PANELBOARD SCHEDULES SHALL REFLECT POWER SOURCE FOR PANEL.
- AIC RATING OF BREAKER INSTALLATIONS SHALL MATCH AIC RATING OF DISTRIBUTION EQUIPMENT IN WHICH BREAKERS ARE TO BE INSTALLED.

AS-BUILT
DATE 12/2021

User: Ryan.Sales 10/11/2020 - 10:11 AM ... Electrical Schedules.dwg

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42043, EXPIRATION DATE: 01/17/2022.

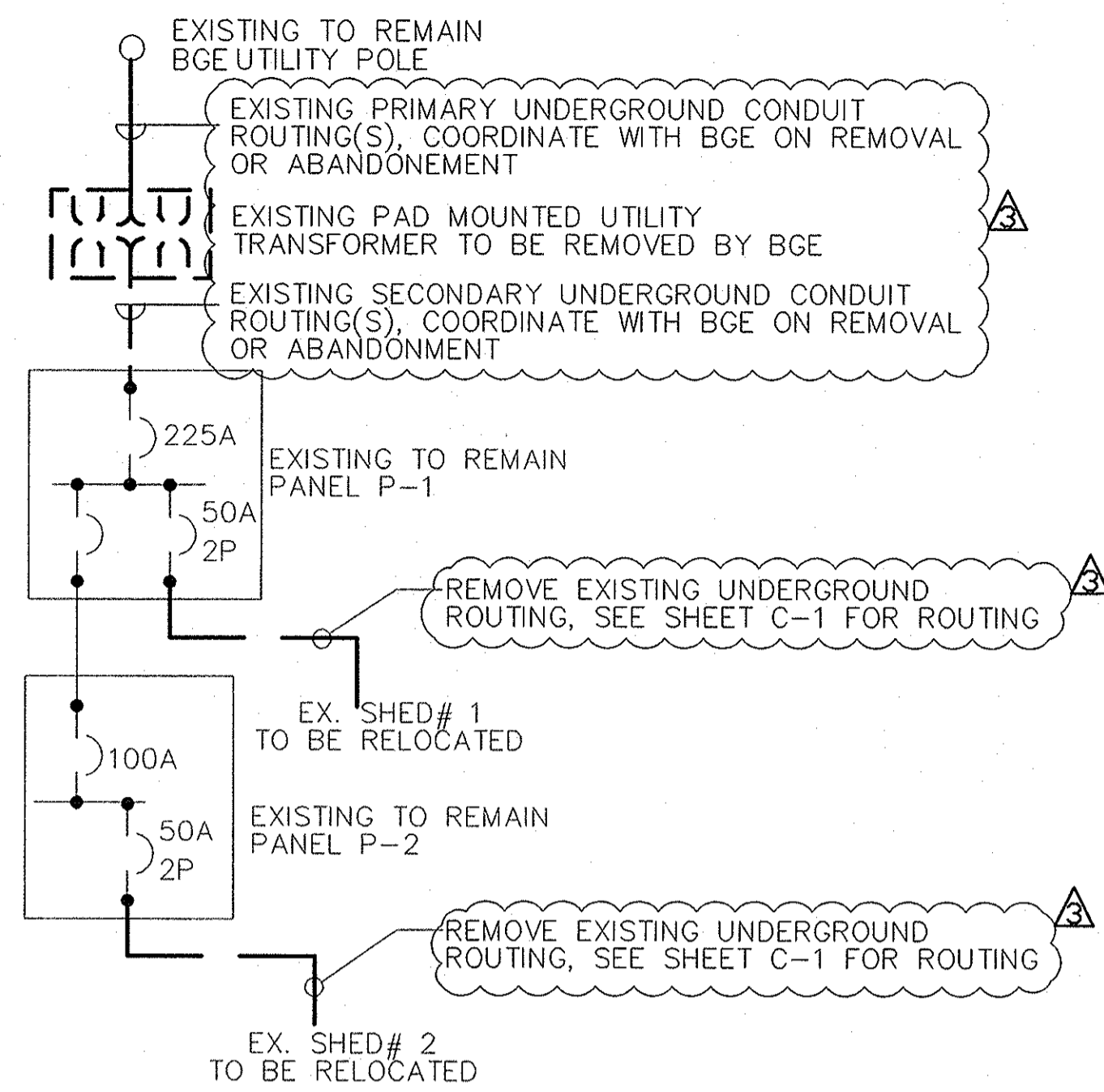
STATE OF MARYLAND
DEPARTMENT OF PUBLIC WORKS
ENGINEERS, PLANNERS, SCIENTISTS, CONSTRUCTION MANAGERS
KCI TECHNOLOGIES

DES: SB					
DRN: SB					
CHK: BRM	JFW	Δ	ELECTRICAL DESIGN UPDATES	6/20	
DATE: AUG, 2016	JFW	Δ	RFI #002	6/20	
BY	NO.		REVISION	DATE	

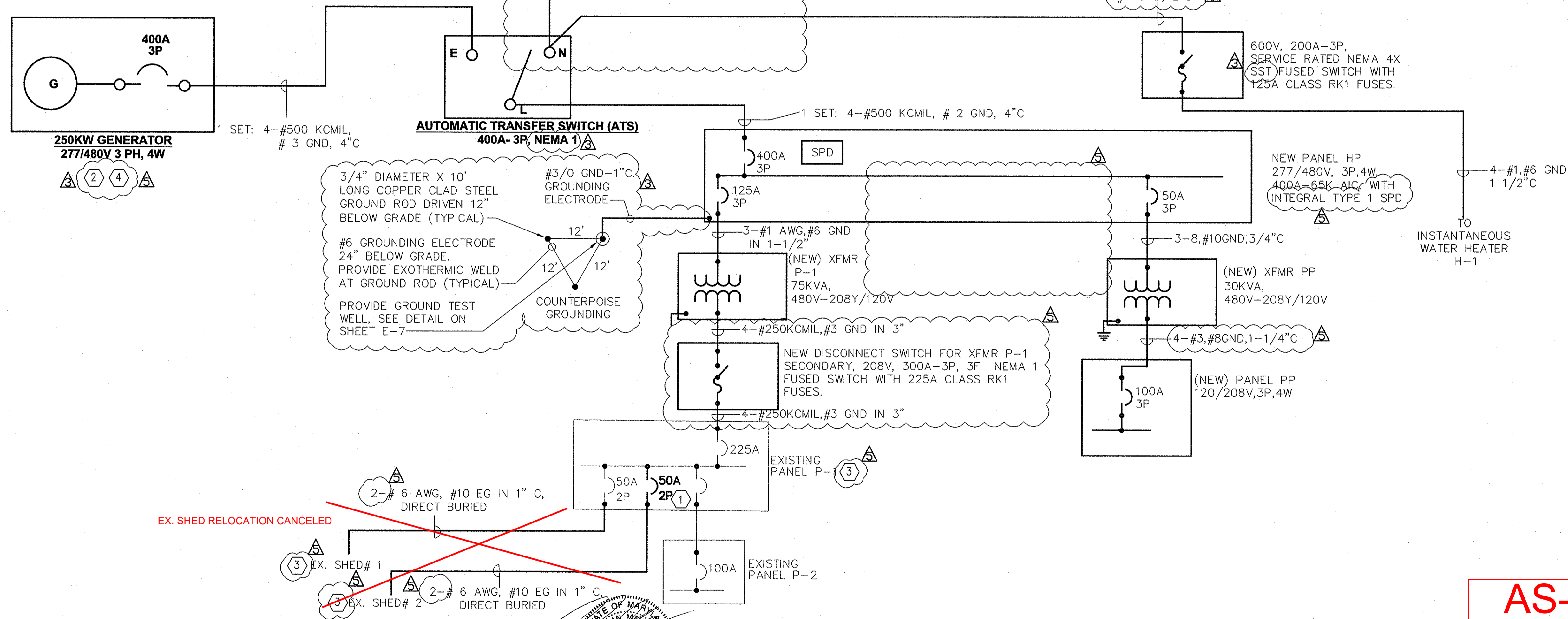
ELECTRICAL PANEL SCHEDULES

60' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

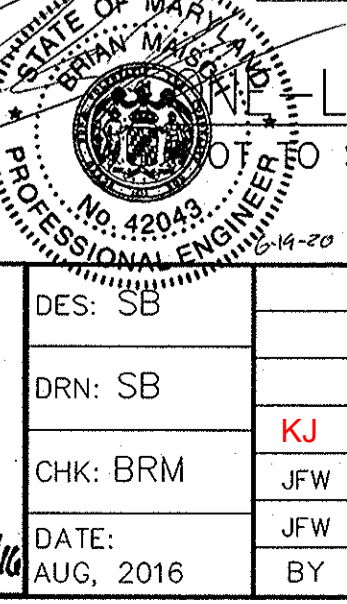


ONE-LINE DIAGRAM-DEMOLITION
NOT TO SCALE



ONE-LINE DIAGRAM-NEW WORK
NOT TO SCALE

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www.kci.com

DES: SB			
DRN: SB			
CHK: BRM	KJ	AS-BUILT	12/21
DATE: AUG, 2016	JFW	ELECTRICAL DESIGN UPDATES	6/20
	JFW	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20
	BY NO.	REVISION	DATE

ELECTRICAL ONE-LINE DIAGRAMS
600' SCALE MAP NO. 40-41 BLOCK NO. 12

- GENERAL NOTES:**
- ALL ELECTRICAL PANELBOARDS, DISCONNECT SWITCHES, BOXES, ETC. SHALL BE PROVIDED WITH PERMANENT LABELS INDICATING THEIR RESPECTIVE POWER SOURCE.
 - ALL CONDUCTORS SHALL BE COPPER, UNLESS NOTED OTHERWISE.
 - THE TRANSFER SWITCHES DO NOT SWITCH THE NEUTRAL, THE SYSTEM IS NOT SEPARATELY DERIVED.
 - SEE PANEL SCHEDULES ON SHEET E-4 FOR ADDITIONAL INFORMATION ON BRANCH CIRCUIT CONDUIT AND WIRING REQUIREMENTS FOR EQUIPMENT.
 - IN ACCORDANCE WITH NEC ARTICLE 701.12, STANDBY GENERATOR POWER SHALL BE AVAILABLE WITHIN 60 SECONDS UPON LOSS OF NORMAL POWER SUPPLY.
 - FINAL PRIMARY AND SECONDARY CONNECTIONS TO INTERIOR FLOOR MOUNTED TRANSFORMERS SHALL BE IN FLEXIBLE METAL CONDUIT.

- KEYED NOTES:**
- PROVIDE (1) 50A-2P CIRCUIT BREAKER IN EXISTING PANEL P-1. NEW BREAKER TYPE SHALL MATCH EXISTING BREAKER A.I.C. RATING AND BE MANUFACTURED BY THE SAME VENDOR AS THE EXISTING PANEL.
 - CONTRACTOR SHALL COORDINATE WITH THE GENERATOR MANUFACTURE FOR QUANTITY AND AMPACITY OF THE GENERATOR AUXILIARY CIRCUITS. SIZE THE CONDUCTORS AND CONDUITS PER NEC.
 - SEPARATE BUILDINGS/STRUCTURES ARE SUPPLIED BY A FEEDER. CONTRACTOR SHALL PROVIDE GROUNDING ELECTRODE SYSTEM PER ALL REQUIREMENTS IN NEC 250.32.
 - GENERATOR SHALL BE FURNISHED WITH A REMOTE SHUTDOWN MEANS FOR THE PRIME MOVER. COMPLY WITH NEC 445.18.

AS-BUILT
DATE 12/2021

User: Robert Williams
Date: 1/19/2020 10:09am
Project: 20210107121238 Download\electrical in Acad 6-24-2015 10:07:12 AM E-205 Electrical One Line.dwg

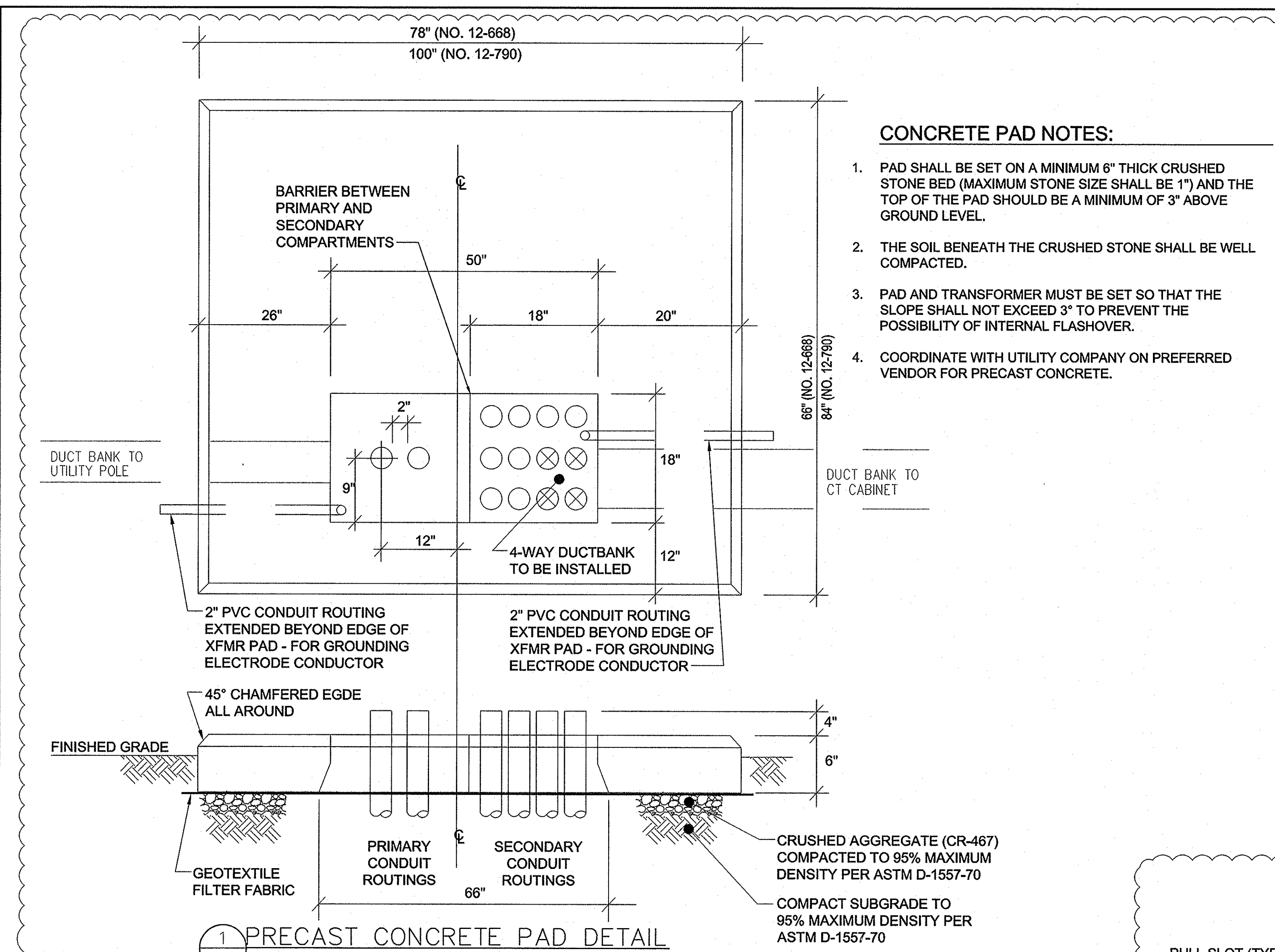
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James E. Kuttler 12/21/21
DATE 12/21/21
CHIEF, BUREAU OF UTILITIES

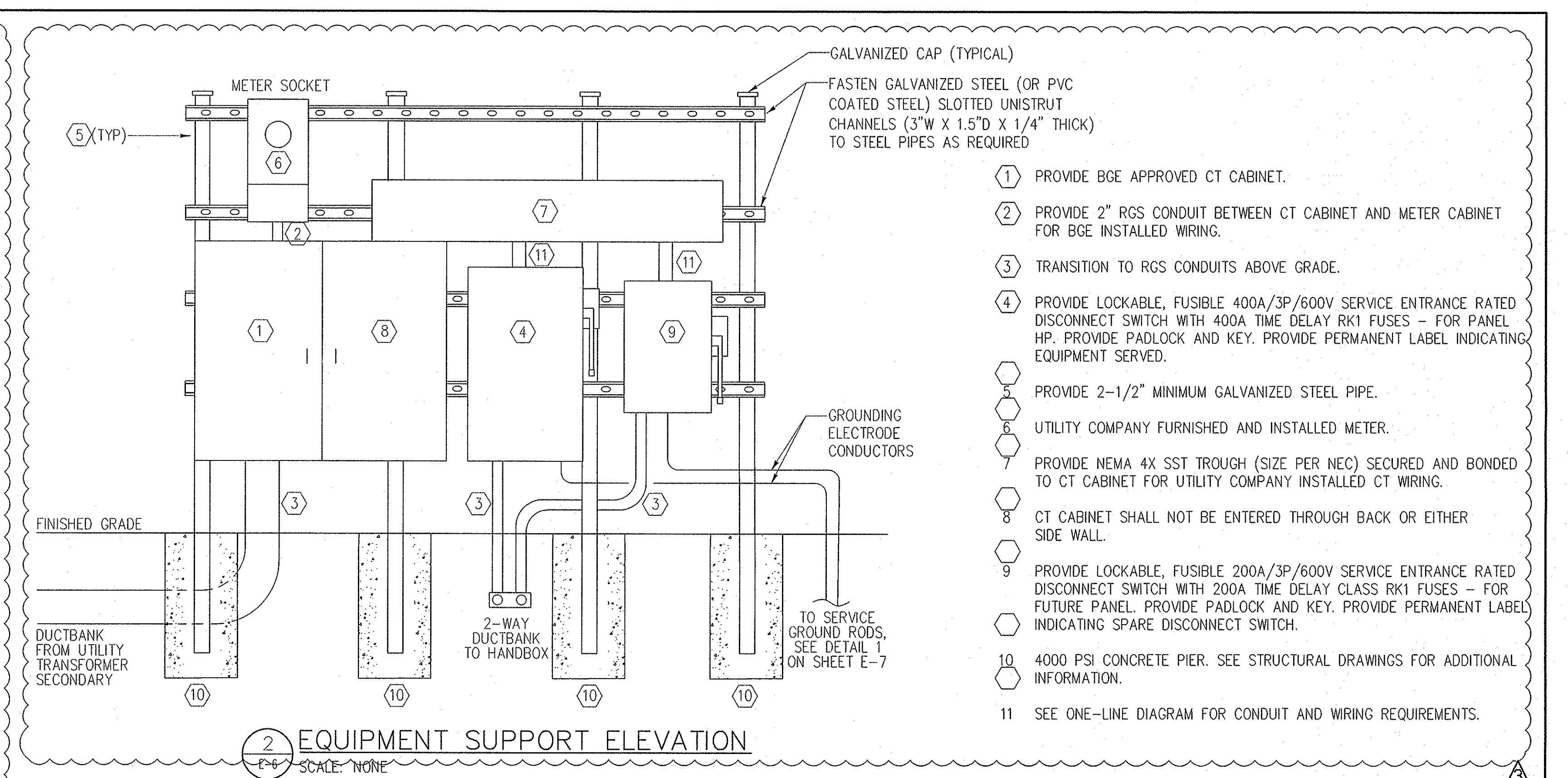
Thomas E. Kuttler 12/21/21
DATE 12/21/21
CHIEF, UTILITY DESIGN DIVISION

ASHLEIGH KNOLLS
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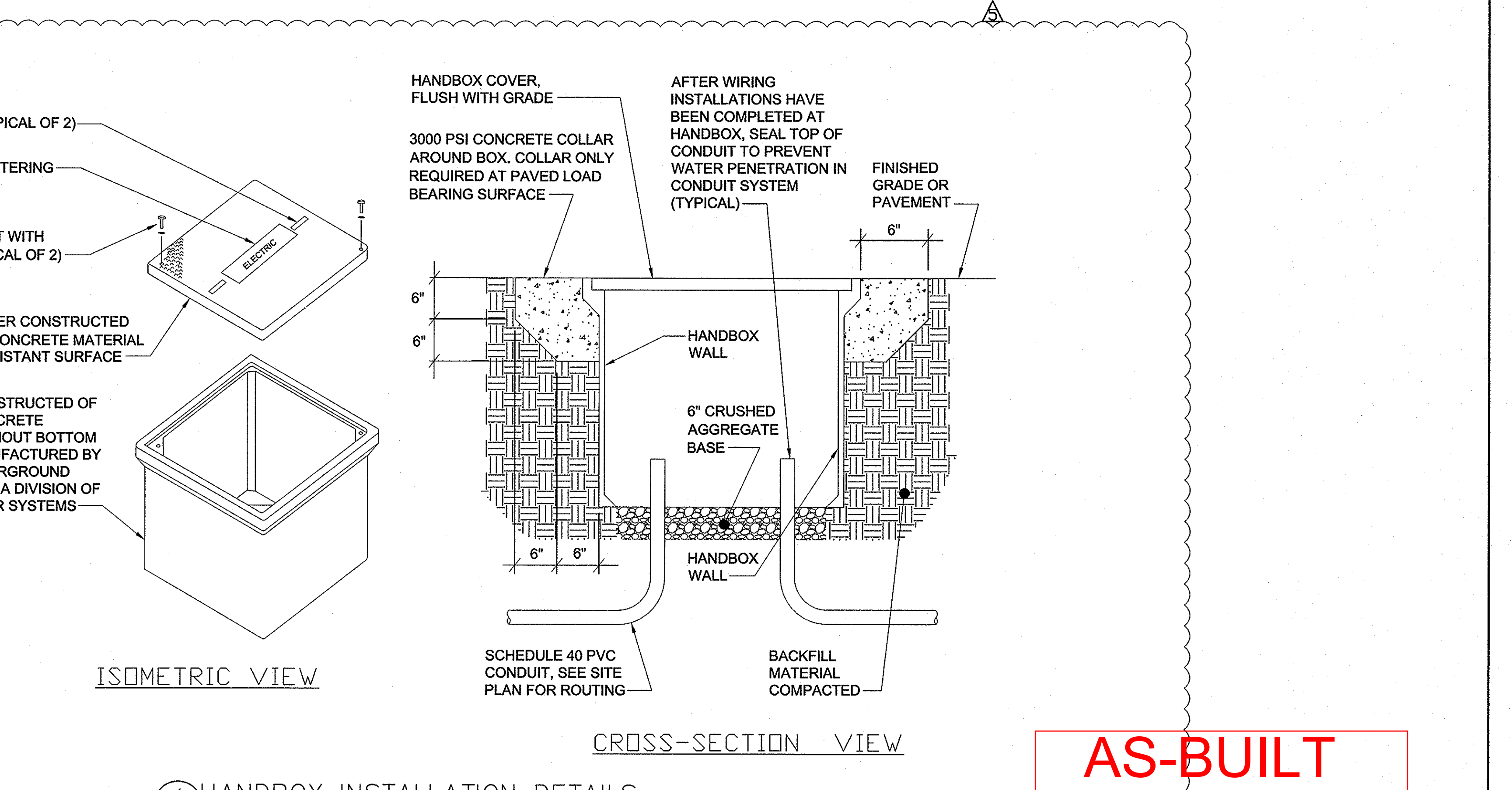
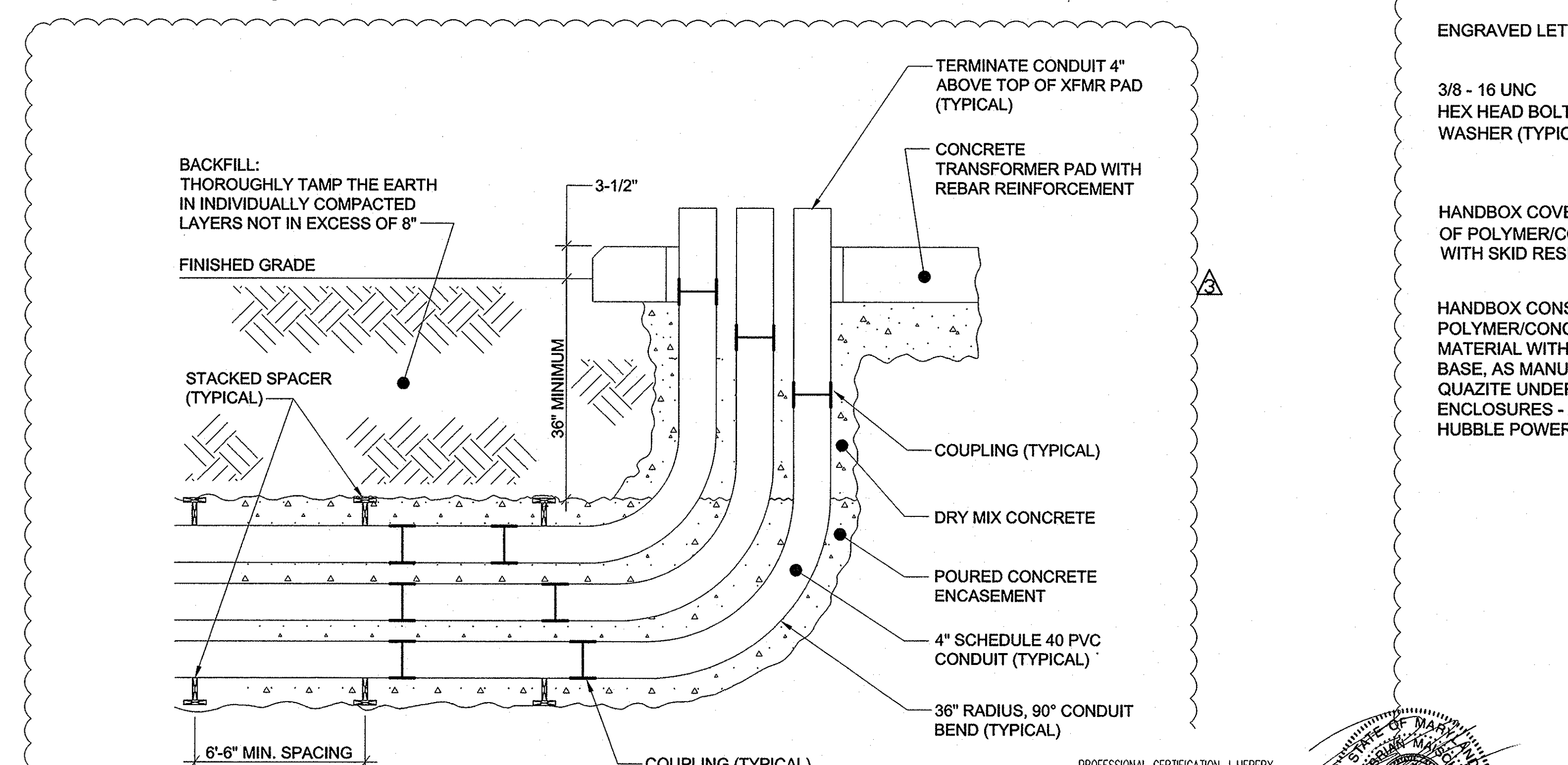
E-5
SCALE AS SHOWN
SHEET 29 OF 43



- CONCRETE PAD NOTES:**
- PAD SHALL BE SET ON A MINIMUM 6" THICK CRUSHED STONE BED (MAXIMUM STONE SIZE SHALL BE 1") AND THE TOP OF THE PAD SHOULD BE A MINIMUM OF 3" ABOVE GROUND LEVEL.
 - THE SOIL BENEATH THE CRUSHED STONE SHALL BE WELL COMPACTED.
 - PAD AND TRANSFORMER MUST BE SET SO THAT THE SLOPE SHALL NOT EXCEED 3" TO PREVENT THE POSSIBILITY OF INTERNAL FLASHOVER.
 - COORDINATE WITH UTILITY COMPANY ON PREFERRED VENDOR FOR PRECAST CONCRETE.



- PROVIDE BGE APPROVED CT CABINET.
- PROVIDE 2" RGS CONDUIT BETWEEN CT CABINET AND METER CABINET FOR BGE INSTALLED WIRING.
- TRANSITION TO RGS CONDUITS ABOVE GRADE.
- PROVIDE LOCKABLE, FUSIBLE 400A/3P/600V SERVICE ENTRANCE RATED DISCONNECT SWITCH WITH 400A TIME DELAY RK1 FUSES - FOR PANEL HP. PROVIDE PADLOCK AND KEY. PROVIDE PERMANENT LABEL INDICATING EQUIPMENT SERVED.
- PROVIDE 2-1/2" MINIMUM GALVANIZED STEEL PIPE.
- UTILITY COMPANY FURNISHED AND INSTALLED METER.
- PROVIDE NEMA 4X SST TROUGH (SIZE PER NEC) SECURED AND BONDED TO CT CABINET FOR UTILITY COMPANY INSTALLED CT WIRING.
- CT CABINET SHALL NOT BE ENTERED THROUGH BACK OR EITHER SIDE WALL.
- PROVIDE LOCKABLE, FUSIBLE 200A/3P/600V SERVICE ENTRANCE RATED DISCONNECT SWITCH WITH 200A TIME DELAY CLASS RK1 FUSES - FOR FUTURE PANEL. PROVIDE PADLOCK AND KEY. PROVIDE PERMANENT LABEL INDICATING SPARE DISCONNECT SWITCH.
- 4000 PSI CONCRETE PIER. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
- SEE ONE-LINE DIAGRAM FOR CONDUIT AND WIRING REQUIREMENTS.



3 CONDUIT TERMINATION AT UTILITY XFMR PAD DETAIL
E-6 SCALE: NONE

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James E. Rutler 2/17/21
CHIEF, UTILITY DESIGN DIVISION

Thomas E. Rutler 2/17/21
CHIEF, BUREAU OF ENGINEERING

KCI TECHNOLOGIES
936 RIDGEBROOK ROAD
SHARPS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
WWW.KCI.COM

4 HANDBOX INSTALLATION DETAILS
E-6 SCALE: NONE

HANDBOX COVER AND ENCLOSURE TO BE TIER 22 RATED IN ACCORDANCE WITH ANSISCTE FOR AREAS WITH OCCASIONAL HEAVY VEHICULAR TRAFFIC

AS-BUILT
DATE 12/2021

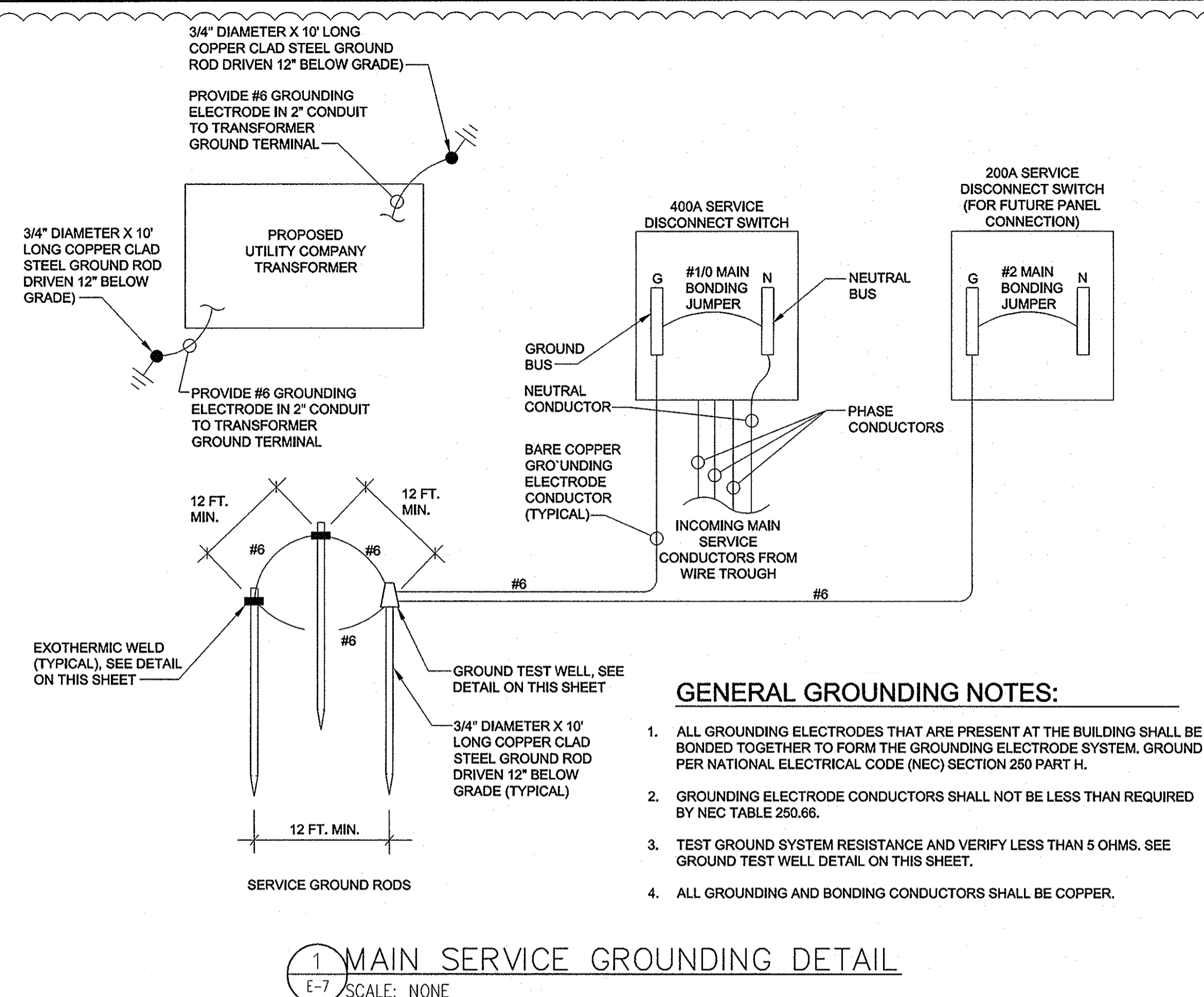
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DRN: SB					
CHK: BRM	JFW	▲	ELECTRICAL DESIGN UPDATES	6/20	
DATE: AUG, 2016	JFW	▲	BUILDING PERMIT COMMENTS - HO. CO. DLP	6/20	
BY: NO.			REVISION	DATE	

ELECTRICAL DETAILS I

600' SCALE MAP NO. 40-41 BLOCK NO. 12

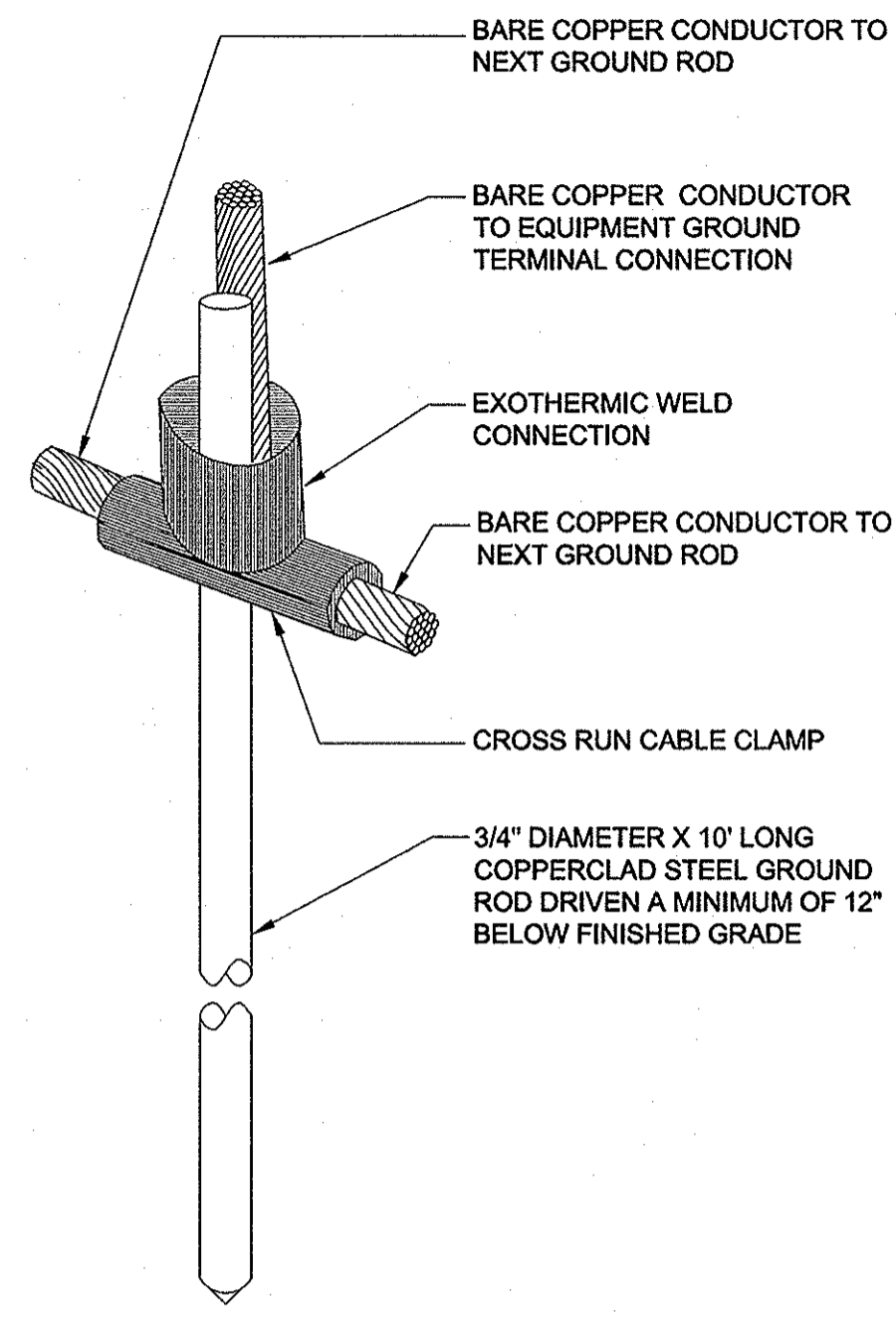
ASHLEIGH KNOLLS
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E-6
SCALE AS SHOWN
SHEET
30 OF 43

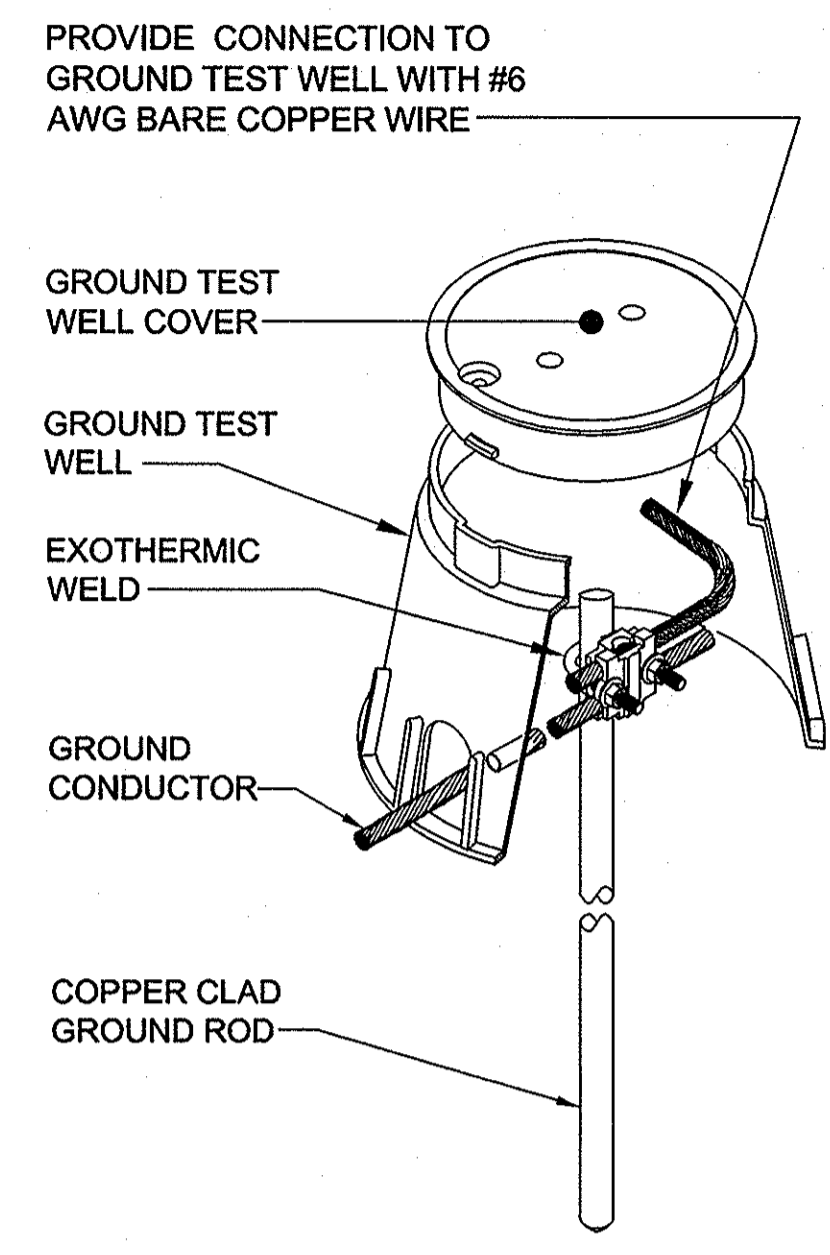


1 MAIN SERVICE GROUNDING DETAIL
E-7 SCALE: NONE

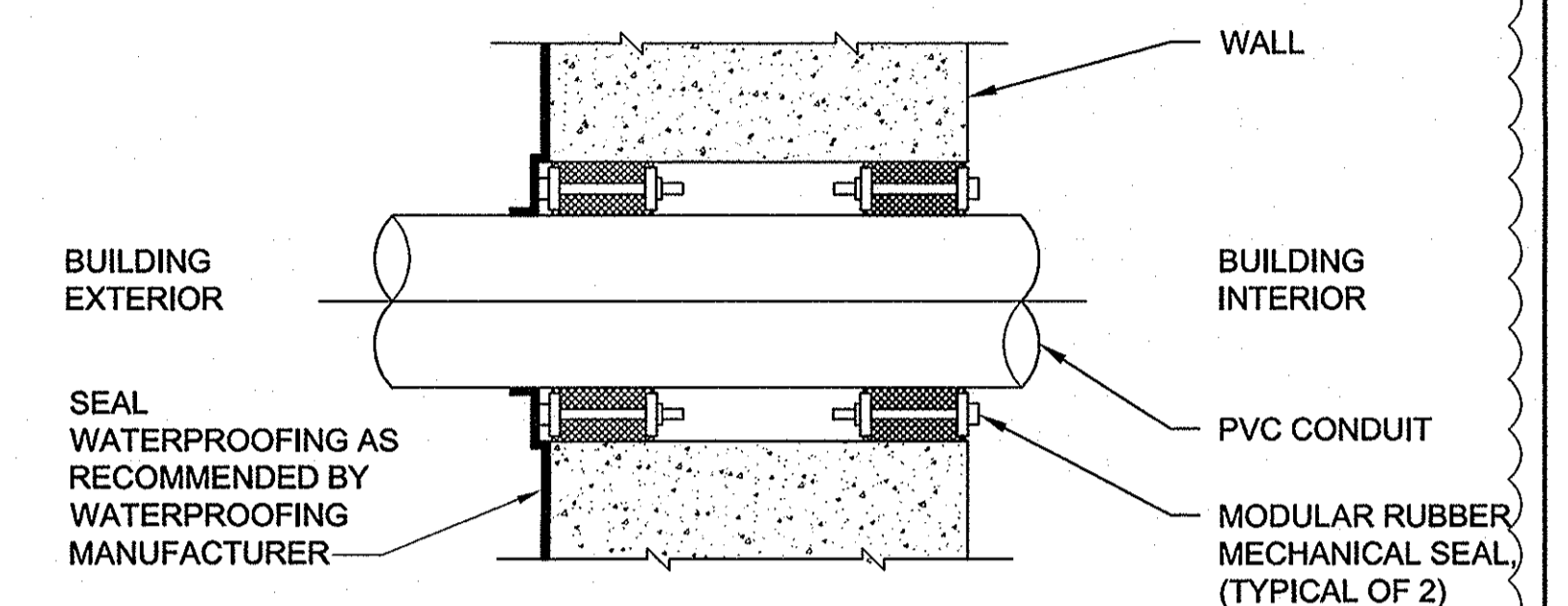
- GENERAL GROUNDING NOTES:**
1. ALL GROUNDING ELECTRODES THAT ARE PRESENT AT THE BUILDING SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM. GROUND PER NATIONAL ELECTRICAL CODE (NEC) SECTION 250 PART H.
 2. GROUNDING ELECTRODE CONDUCTORS SHALL NOT BE LESS THAN REQUIRED BY NEC TABLE 250.66.
 3. TEST GROUND SYSTEM RESISTANCE AND VERIFY LESS THAN 5 OHMS. SEE GROUND TEST WELL DETAIL ON THIS SHEET.
 4. ALL GROUNDING AND BONDING CONDUCTORS SHALL BE COPPER.



2 GROUND ROD DETAIL
E-7 SCALE: NONE

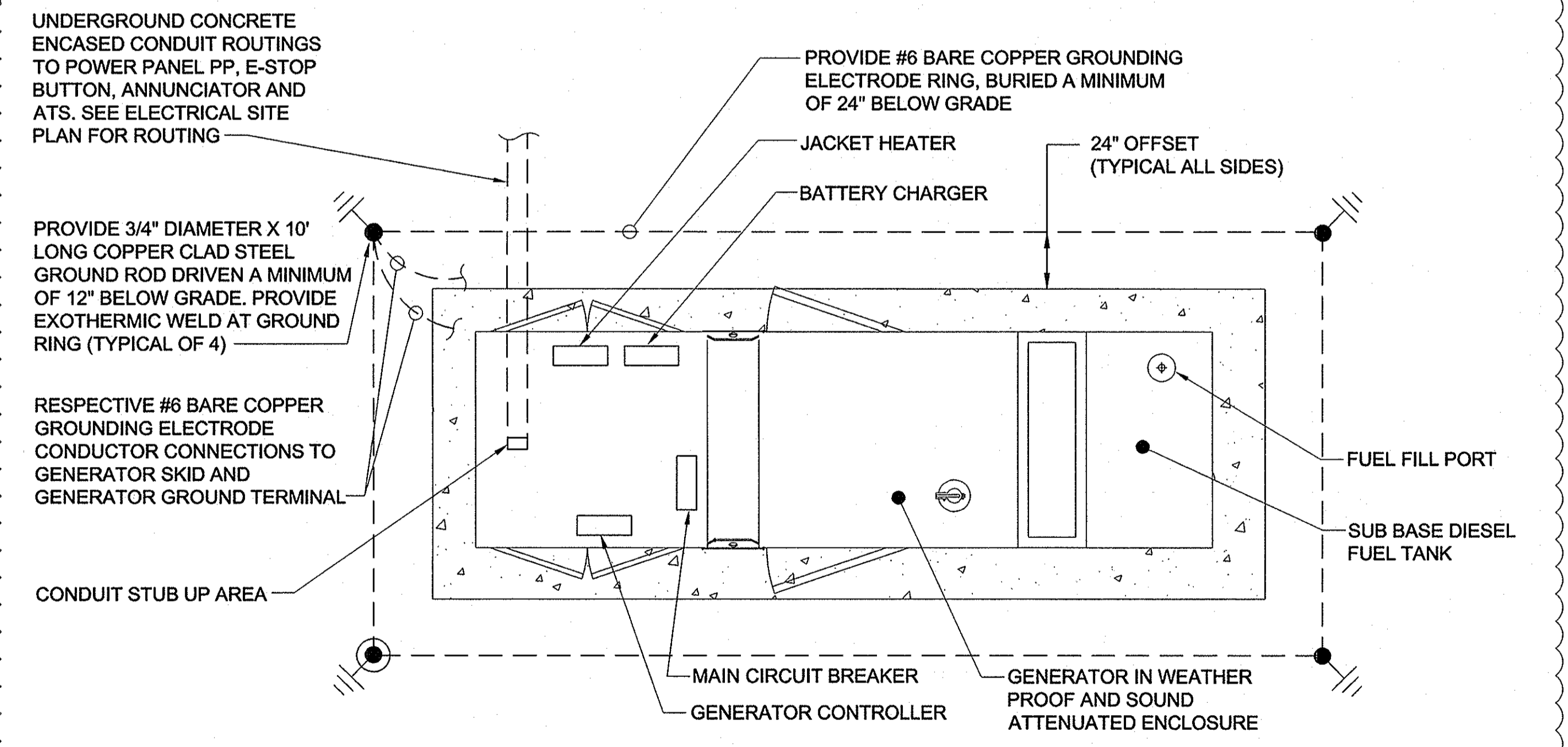


3 GROUND TEST WELL DETAIL
E-7 SCALE: NONE

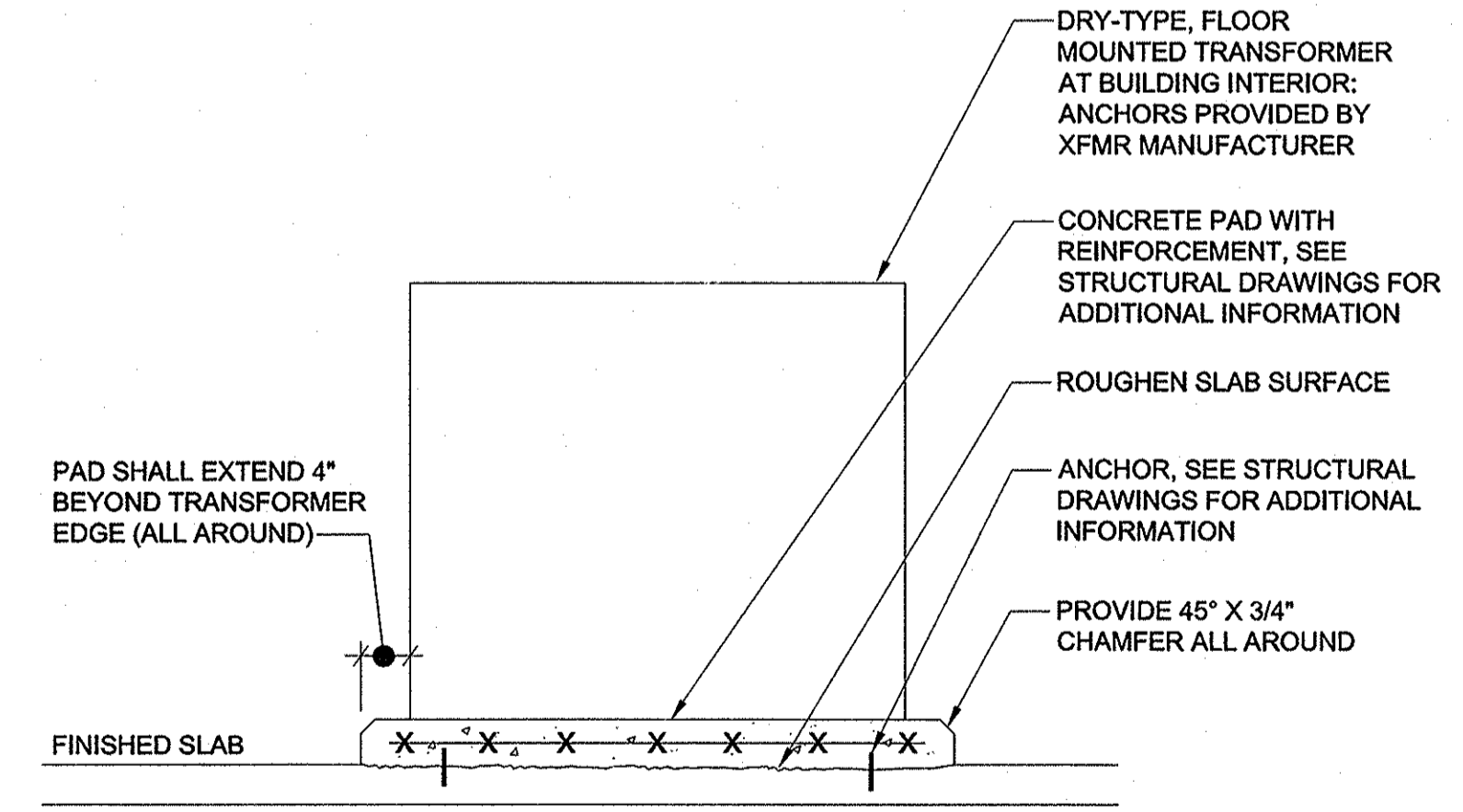


4 WALL PENETRATION DETAIL
E-7 SCALE: NONE

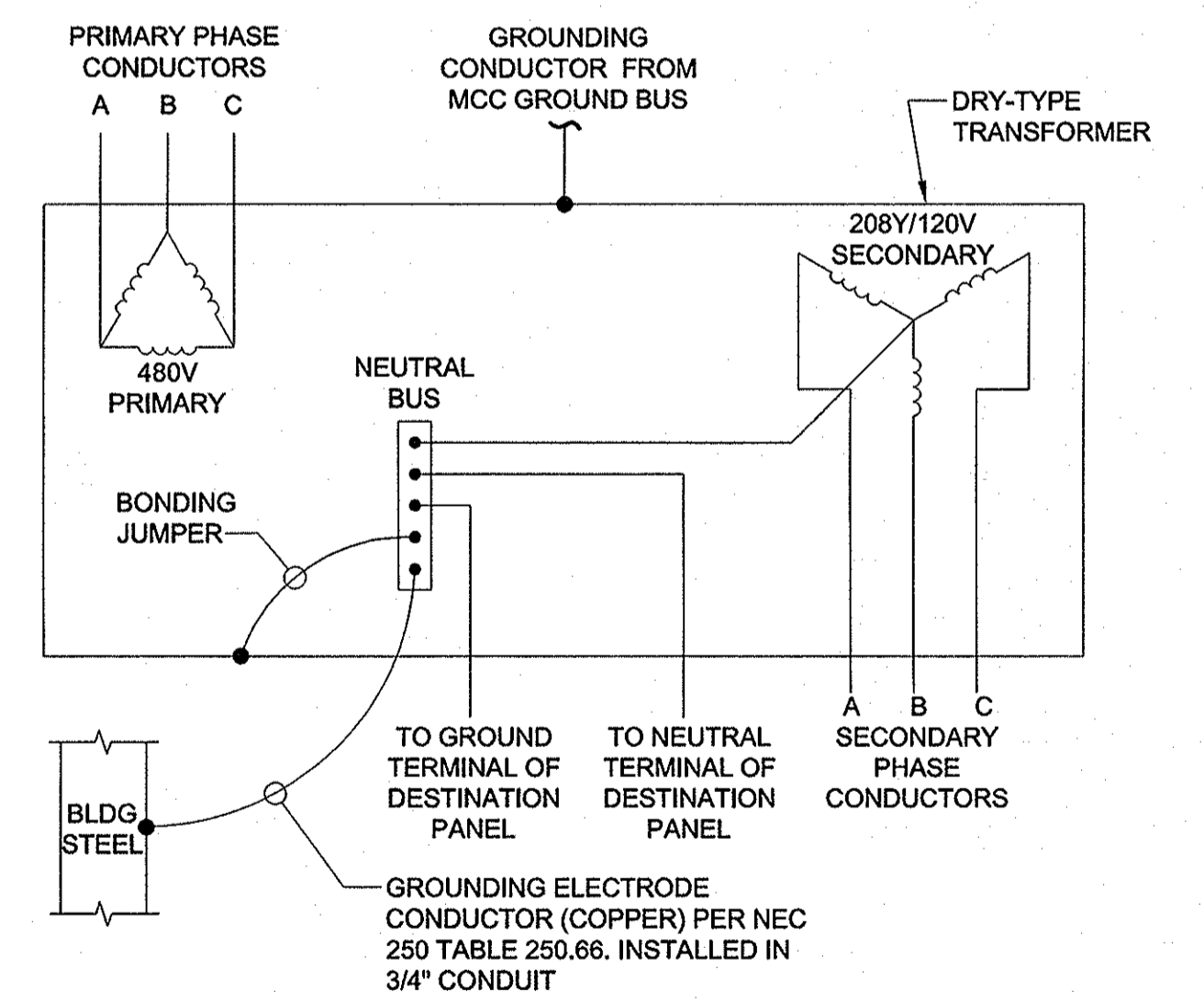
NOTES:
1. CORE DRILL HOLES TO ACCOMMODATE CONDUITS AND MECHANICAL SEALS.
2. SEAL ALL CONDUIT PENETRATIONS WITH APPROVED MATERIALS.



5 EXTERIOR GENERATOR AND GROUND RING PLAN
E-7 SCALE: NONE



6 BLDG. INTERIOR XFMR MOUNTING DETAIL
E-7 SCALE: NONE

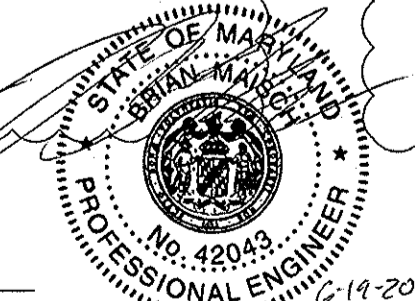


7 BUILDING INTERIOR XFMR GROUNDING DETAIL
E-7 SCALE: NONE

AS-BUILT
DATE 12/2021

Jun 19, 2020 - 10:11 am
 User: Robert Williams
 Location: C:\Users\Robert Williams\Documents\AS-BUILT\Drawings\Electrical in Acad - 6-24-2015\0107137800_E-006_Electrical Details.dwg

PROFESSIONAL CERTIFICATION - I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42043, EXPIRATION DATE: 01/11/2022



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

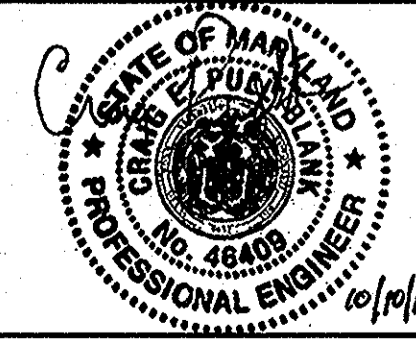
Robert Williams 2/6/17
DIRECTOR OF PUBLIC WORKS
CHIEF, BUREAU OF UTILITIES

Thomas E. Butler 2/6/17
CHIEF, BUREAU OF ENGINEERING
CHIEF, UTILITY DESIGN DIVISION

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DES:	SB				
DRN:	SB				
CHK:	BRM	JFW	▲	ELECTRICAL DESIGN UPDATES	6/20
DATE:		JFW	▲	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20
AUG, 2016		BY	NO.	REVISION	DATE

ELECTRICAL DETAILS II

600' SCALE MAP NO. 40-41 BLOCK NO. 12

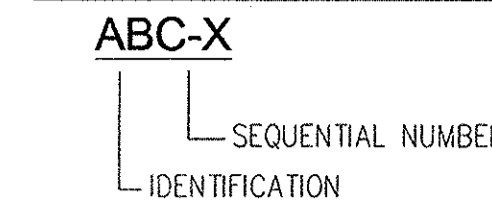
ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE
AS SHOWN

SHEET

30A OF 43

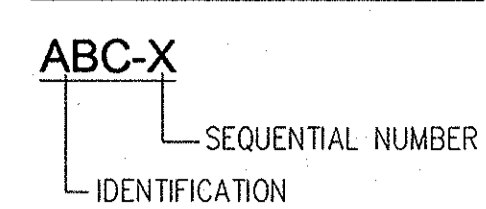
EQUIPMENT LEGEND



EQUIPMENT

- AE ANALYZER ELEMENT
- BDD BACK DRAFT DAMPER
- BFP BACK FLOW PREVENTER
- CGD COMBUSTIBLE GAS DETECTOR
- CV CONTROL VALVE
- EF EXHAUST FAN
- EUH ELECTRIC UNIT HEATER
- FCV FLOW CONTROL VALVE
- FE FLOW ELEMENT
- FIT FLOW INDICATE TRANSMITTER
- IB INTRINSIC BARRIER
- IWH INSTANTANEOUS WATER HEATER
- LE LEVEL ELEMENT
- LIT LEVEL INDICATE TRANSMITTER
- LS LEVEL SWITCH
- MCC MOTOR CONTROL CENTER
- ME MIST ELIMINATOR
- MM MOTOR MONITOR
- MOD MOTOR OPERATED DAMPER
- MOV MOTOR OPERATED VALVE
- NFHB NON-FREEZE HOSE BIB
- PCP PROGRESSIVE CAVITY PUMP
- PLC PROGRAMMABLE LOGIC CONTROLLER
- SAP SUBMERSIBLE AERATION PUMP
- SF SUPPLY FAN
- SMX SUBMERSIBLE MIXER
- VFD VARIABLE FREQUENCY DRIVE
- VV VENT VALVE
- WWP WASTE WATER PUMP
- XFMR TRANSFORMER

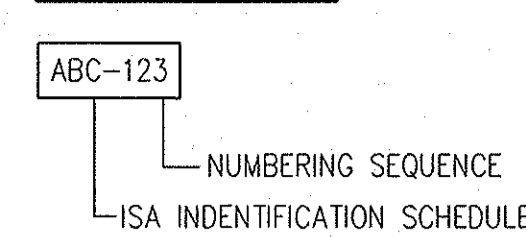
P & I PANEL LEGEND



PANEL LEGEND

- BPCP-X BOOSTER PUMP CONTROL PANEL
- HOA-X HAND-OFF-AUTO CONTROL PANEL
- LC LOCAL CONTROL
- MCC-X MOTOR CONTROL CENTER
- SBR-X SEQUENCE BATCH REACTOR
- VCP-X VENTILATION CONTROL PANEL
- VFD-X VARIABLE FREQUENCY DRIVE
- IPCP INFLUENT PUMP CONTROL PANEL
- RDP RUN DRY PROTECTION
- SWP SEAL WATER PANEL

P&ID LEGEND



P&ID NUMBERING SEQUENCE

- 100 SERIES INFLUENT PUMPING
- 200 SERIES SBR SYSTEMS
- 300 SERIES AUXILIARY SYSTEMS
- 400 SERIES GENERATOR

GENERAL ABBREVIATIONS

- AUTO AUTOMATIC
- ATS AUTOMATIC TRANSFER SWITCH
- CB CIRCUIT BREAKER
- DC DIRECT CURRENT
- DPDT DOUBLE POLE-DOUBLE THROW
- ECD ELECTRICAL CONTROL DIAGRAM
- ETM ELAPSED TIME METER
- GND GROUND
- HMI HUMAN MACHINE INTERFACE
- I/O INPUT/OUTPUT
- JB JUNCTION BOX
- MB MAIN BREAKER
- OIT OPERATOR INTERFACE TERMINAL
- P&ID PROCESS AND INSTRUMENTATION DIAGRAM
- PM PHASE MONITOR
- SI SYSTEM(S) INTEGRATOR
- TB TERMINAL BOARD
- TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION
- VAC VOLTS/ALTERNATING CURRENT
- VFD VARIABLE FREQUENCY DRIVE
- XFMR TRANSFORMER

INSTRUMENT, EXAMPLES

- FIT FLOW INDICATING TRANSMITTER
- PIT PRESSURE INDICATING TRANSMITTER
- ZS POSITION SWITCH

PROCESS LEGEND

- D DRAIN
- NPW NON-POTABLE WATER
- PW POTABLE WATER
- S SANITARY
- WW WASTE WATER

CONSTRUCTION NOTES

- 1 SEE MECHANICAL DRAWINGS FOR DETAILED PROCESS PIPING AND INSTRUMENT LOCATIONS.
- 2 THE I&C DRAWINGS DEPICT SBR AND COUNTY SYSTEMS INTEGRATOR SCOPE.

(ISA) INSTRUMENT IDENTIFICATION SCHEDULE

FIRST LETTER	VARIABLE	MODIFIER	SUCCEEDING LETTER		
			PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		AUTOMATIC
B	BREAKER		USER'S CHOICE	CLOSE OR STOP	BYPASS/REVERSE
C	COMMUNICATIONS			CONTROL	
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL/INCOMPLETE
G	GAUGING		GLASS		LOCAL/MANUAL/HAND
H	HAND				HIGH OR OPEN
I	CURRENT		INDICATE		INTERMEDIATE
J	POWER	SCAN			
K	TIME	TIME RATE		CONTROL STATION	
L	LEVEL		LIGHT		LOW OR CLOSE
M	MOTOR	MOMENTARY		MOTOR	MIDDLE
N	STATUS		INPUT	FORWARD	ON OR OPERATE
O				OFF	OVERLOAD
P	PRESSURE	PNEUMATIC	POINT (TEST)	POSITION	
Q	QUALITY OR EVENT	TOTALIZE		EMERGENCY/ABNORMAL	
R	RADIOACTIVITY		RECORD OR PRINT	REMOTE	RUN/FORWARD
S	SPEED OR FREQUENCY	SUM	SWITCH		STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	VFD/VALVE
W	WEIGHT OR FORCE	TORQUE	WELL		UNCLASSIFIED
X	MOD. LIGHT OR VALVE		UNCLASSIFIED	UNCLASSIFIED	RESET
Y	INTERLOCK			RELAY OR COMPUTE	
Z	POSITION			DRIVE OR ACTUATOR	

LEGEND

- EX. FEATURES
- EX. PHONELINE
- POWER
- DIGITAL SIGNALS
- NEW FEATURES
- ANALOG SIGNALS
- HIGH SPEED COMM-LINK

GENERAL NOTES

1. SEE MECHANICAL DRAWINGS FOR CONTROL AND FIELD INSTRUMENT LOCATIONS.
2. FOR P&ID AND ECD SYMBOLS, SEE SHEET I-2.
3. FOR POWER DISTRIBUTION AND DISCONNECT REQUIREMENTS, SEE ELECTRICAL DRAWINGS.

CONDUIT (CONDUCTOR FILL) SCHEDULE

SIZE	#12 THHN	#14 THHN	#16 TFS
3/4"	10	20	5
1"	15	30	8
1 1/2"	35	70	18
2"	60	120	30
3"	125	250	60
4"	200	400	100

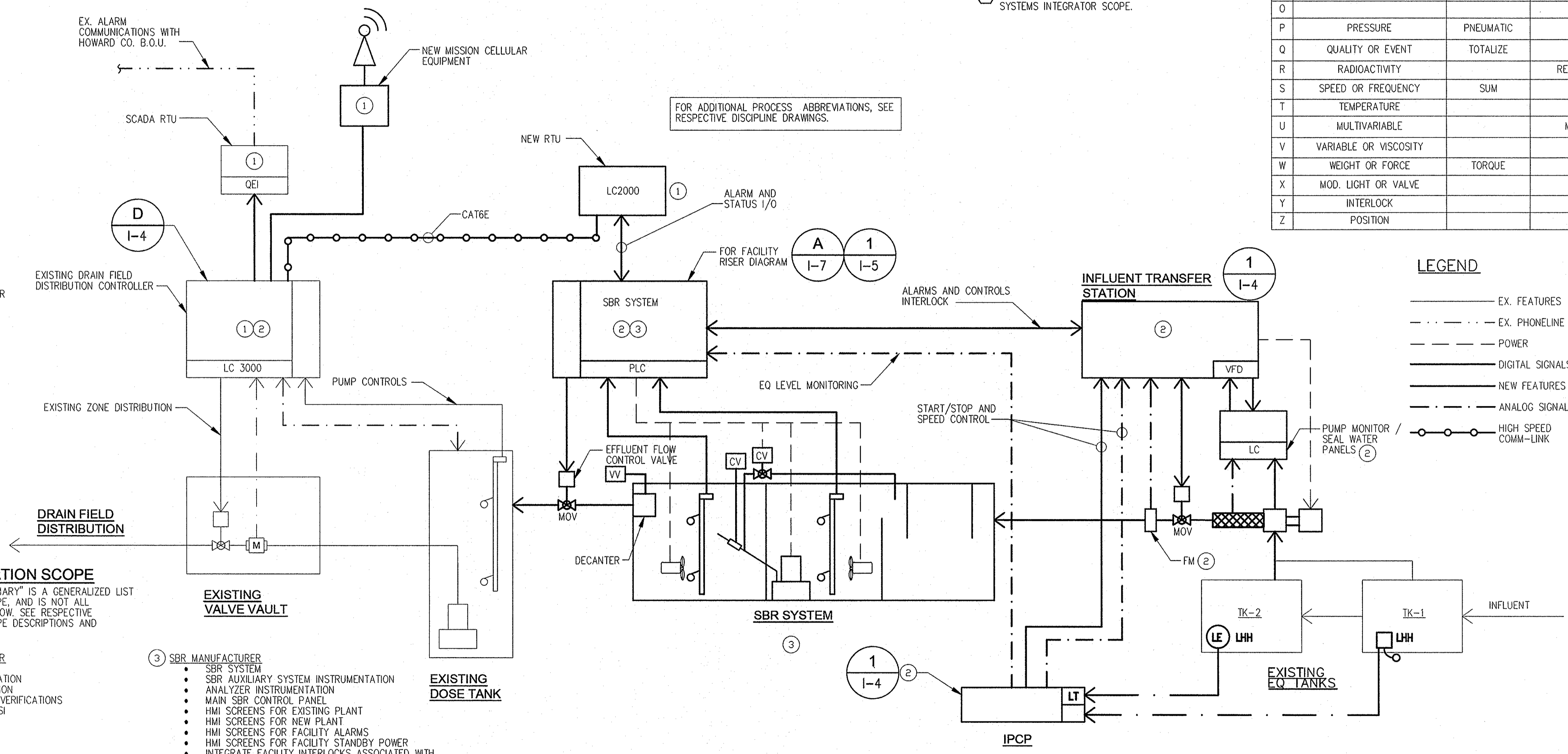
NOTES:

1. MAXIMUM FILL QUANTITIES SHOWN.
2. CONTRACTOR SHALL COMPLY WITH NEC STANDARDS AND MANUFACTURER'S RECOMMENDATIONS WHEN DETERMINING CONDUIT SIZES AND CONDUCTOR GROUPINGS WITHIN EACH CONDUIT.

SBR FACILITY INTERGRATION SCOPE

NOTE: THE FOLLOWING "SCOPE SUMMARY" IS A GENERALIZED LIST OF CONTRACTORS INTEGRATION SCOPE, AND IS NOT ALL INCLUSIVE TO THE ITEMS LISTED BELOW. SEE RESPECTIVE SPECIFICATIONS FOR COMPLETE SCOPE DESCRIPTIONS AND RESPONSIBILITIES.

- 1 COUNTY SCADA SYSTEMS INTEGRATOR
 - LC2000 INTEGRATION
 - LC2000 REMOTE I/O INTEGRATION
 - MISSION CELLULAR INTEGRATION
 - PRE-STARTUP TERMINATION VERIFICATIONS
 - COORDINATE WITH PROJECT SI
 - STARTUP AND TESTING
 - TRAINING
 - AS-BUILTS
- 2 PROJECT SYSTEMS INTEGRATOR
 - COORDINATE WITH ALL SUPPLIERS
 - SBR SYSTEM INTEGRATION
 - INFLUENT PUMP STATION CONTROLS
 - PUMP MONITOR SEAL WATER PANEL
 - FLOW METER (INFLUENT)
 - PUMP MONITORING INSTRUMENTATION
 - INFLUENT STORAGE TANK LEVEL CONTROLS
 - SMOKE DETECTOR SYSTEM
 - CAUSTIC AND CARBON ADDITION SYSTEMS LOCAL CONTROLS
 - SODIUM HYPOCHLORITE SYSTEM LOCAL CONTROLS
 - VENTILATION SYSTEM AND CONTROLS
 - PRE-STARTUP TERMINATION VERIFICATIONS
 - STARTUP AND TESTING
 - TRAINING
 - COMPLETE PROJECT WIRING TERMINATION DRAWINGS
 - COORDINATE AND FURNISH PROJECT AS-BUILTS
- 3 SBR MANUFACTURER
 - SBR SYSTEM
 - SBR AUXILIARY SYSTEM INSTRUMENTATION
 - ANALYZER INSTRUMENTATION
 - MAIN SBR CONTROL PANEL
 - HMI SCREENS FOR EXISTING PLANT
 - HMI SCREENS FOR NEW PLANT
 - HMI SCREENS FOR FACILITY ALARMS
 - HMI SCREENS FOR FACILITY STANDBY POWER
 - INTEGRATE FACILITY INTERLOCKS ASSOCIATED WITH INFLUENT AND EFFLUENT PUMPING STATIONS
 - STARTUP AND TESTING
 - TRAINING
 - COORDINATION WITH PROJECT SYSTEMS INTEGRATOR
 - COORDINATION WITH COUNTY SCADA SYSTEMS INTEGRATOR
 - AS-BUILTS
- 4 MECHANICAL CONTRACTOR
 - PACKAGED PW / NPW / SEAL WATER SYSTEMS
 - MOTORIZED VALVES
 - FANS
 - ALL CHEMICAL SYSTEM PUMPS, TANKS, CONTAINMENTS, RAMPS, PH CONTROLLER AND SYSTEM COMPONENTS
- 5 ELECTRICAL CONTRACTOR
 - POWER
 - LIGHTING
 - STANDBY POWER
 - ALL POWER AND SIGNAL CONDUIT AND CONDUCTORS
 - AS-BUILTS



1 ASHLEIGH KNOLLS TREATMENT SYSTEM COMMUNICATIONS DIAGRAM

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33825, EXPIRATION DATE: 01/15/21

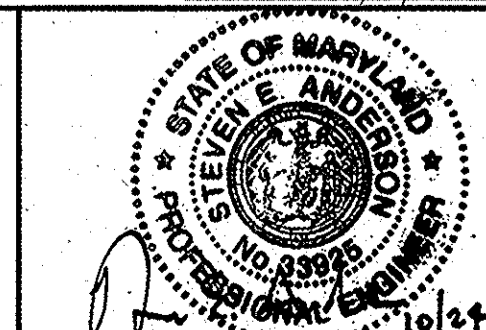


DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works 2/6/17
Chief, Bureau of Engineering 2/6/17
Chief, Bureau of Utilities 11/2/17
Chief, Utility Design Division 2/17/17

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FAX: (410) 316-7818
WWW.KCI.COM



DES: JFW
DRN: JFW
CHK: SEA
DATE: AUG, 2016

INSTRUMENTATION LEGEND

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-1
SCALE AS SHOWN
SHEET
31 OF 43

Jun 12, 2020 - 11:16pm User: Jordan.Wife Path: C:\Users\Jordan.Wife\Documents\Instrumentation Legend.dwg

PROCESS AND INSTRUMENTATION SYMBOLS

- EXISTING PROCESS FEATURES
- DIGITAL SIGNALS
- EQUIPMENT GROUPED AS A GROUPING TYPICAL ARRANGEMENT OF MULTIPLES OF THE SAME PROCESS.
- ETHERNET COMMUNICATIONS
- ELECTRICAL SIGNAL
- SOFTWARE OR COMMUNICATIONS DATA SIGNAL
- ANALOG SIGNALS
- VENT
- PNEUMATIC SIGNAL (COMPRESSED AIR)
- ELECTRICAL SERVICE
- PROCESS FLOW
- ↑ ANALOG INPUT
- ↓ ANALOG OUTPUT
- ↑ DIGITAL INPUT
- ↓ DIGITAL OUTPUT
- (X) X = A DESIGNATED CONTINUATION NUMBER WITH RESPECT TO A SPECIFIC SIGNAL. E.G.
① ———→
② ———→
- TS 112 CONTROL LOGIC I/O INTERFACE
- TS 112 FIELD-MOUNTED DEVICE
- AIT 110 PANEL-MOUNTED DEVICE
- ABC 123 X INDICATING LAMP - X INDICATES LENS COLOR:
R = RED G = GREEN
W = WHITE A = AMBER
- AH 110 PLC OR REMOTE INPUT/OUTPUT
- AH 123 TELEMETRY/SCADA SYSTEM INPUT/OUTPUT
- SB (X) SIGNAL BOOSTER/ISOLATOR
(X) PANEL LOCATION
- LE XXX SUBMERSIBLE TRANSDUCER
- LE XXX ULTRASONIC LEVEL INSTRUMENT
- LE XXX RADAR LEVEL INSTRUMENT
- I (X) INTERPOSING RELAY (X) PANEL LOCATION
- SEE X-XX PROCESS CONTINUATION

ABC-123 { ABC - LETTERS INDICATE FUNCTION ACCORDING TO IDENTIFICATION ASSOCIATED WITH ISA SCHEDULE.
123 - DIGITS INDICATE SEQUENTIAL EQUIPMENT

PROCESS AND INSTRUMENTATION SYMBOLS

- PRESSURE SWITCH
- LIMIT SWITCH
- FLOW SWITCH
- FLOAT SWITCH
- RECEPTACLE
- EXTERIOR PLUG CONNECTION
- TERMINAL BOARD
- TERMINAL ENCLOSURE OR J - JUNCTION
- ELECTRICAL DISCONNECT
- JUNCTION BOX, HAZARDOUS LOCATION
- JUNCTION BOX, NON-HAZARDOUS LOCATION
- EXPLOSION PROOF SEAL-OFF

HAND SWITCHES

- HS (XXX) 123 SELECTOR SWITCH OR PUSH BUTTON (MAINTAINED CONTACTS)
- HK (XXX) 123 HAND CONTROL STATION
- HMS (XXX) 123 MOMENTARY SELECTOR SWITCH

HAND SWITCH NOTES (XXX)

- ACK = ACKNOWLEDGE PUSHBUTTON
- CL = CLOSE (PUSHBUTTON)
- ES = EMERGENCY STOP (PUSHBUTTON)
- HOA = HAND OFF AUTOMATIC (SELECTOR SWITCH)
- LO = LOCKOUT STOP (PUSHBUTTON)
- LR = LOCAL/REMOTE (SELECTOR SWITCH)
- MA = MANUAL/AUTOMATIC (SELECTOR SWITCH)
- OP = OPEN (PUSHBUTTON)
- POT = POTENTIOMETER (HAND CONTROL)
- RES = RESET (PUSHBUTTON)
- SEL = SELECTOR
- SP = STOP (PUSHBUTTON)
- ST = START (PUSHBUTTON)

ANALYZERS

- AE XXX XXX-INDICATES:
CH4 - METHANE

EQUIPMENT SYMBOLS

- AIR RELEASE VALVE
- BALL CHECK VALVE
- BALL VALVE
- CENTRIFUGAL PUMP
- CHECK VALVE
- EXPANSION JOINT
- FLEXIBLE HOSE
- FLOAT
- FLOW METER (MAGNETIC)
- GATE VALVE
- HOSE BIBB
- MOTOR
- MOTOR ACTUATOR
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- SUBMERSIBLE MIXER
- PUMP (AUXILIARY)
- REDUCER OR INCREASER
- SLUICE GATE
- SOLENOID VALVE
- TWO-WAY-THREE PORT VALVE, OR THREE WAY VALVE
- TRUCK QUICK CONNECTION
- UNION

ELECTRICAL CONTROL DIAGRAM SYMBOLS (ECD)

- INCOMING LINE
- OUTGOING LINE
- CIRCUIT BREAKER
- CONTACTS - NORMALLY CLOSED
- CONTACTS - NORMALLY OPEN
- CONTROL POWER TRANSFORMER
- CONTROL RELAY (SEQUENTIAL)
- DISCONNECT SWITCH
- ELAPSED TIME METER
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL DROP
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL RISE
- FUSE
- GROUND (GND)
- HEAT TRACE
- HAND-OFF AUTOMATIC SWITCH
- INDICATING LAMP INTEGRAL WITH HOA SELECTOR
- LIMIT SWITCH - NORMALLY OPEN
- MANUAL MOTOR STARTER, SINGLE-POLE
- OVERCURRENT ELEMENT THERMOSTAT
- PHASE MONITOR
- PLC OUTPUT (RTU OUTPUT)
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE DROP
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE RISE
- PUSH-BUTTON - MOMENTARY CONTACT
- PUSH-BUTTON - MOMENTARY CONTACT START/STOP
- PUSH-PULL BUTTON - MAINTAINED CONTACT
- REPEAT CYCLE TIMER
- SOLENOID

ELECTRICAL CONTROL DIAGRAM SYMBOLS (ECD)

- STARTER OR CONTACT COIL - DESIGNATION AS INDICATED
- START-STOP PUSHBUTTON - MAINTAINED CONTACT
- THERMOSTAT, NORMALLY CLOSED
- TIMER
- TORQUE SWITCH - N.O. - CLOSES ON HIGH TORQUE

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD)

- REMOTE
- AT PLC CABINET
- △ AT LOCAL PANEL
- ▲ AT MOTOR CONTROL CENTER
- ⊙ AT PANEL BOARD
- ⊙ AT VFD PANEL

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD)

- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- ⊕ POWER SUPPLY CONNECTION
- PANEL CONNECTIONS
- REMOTE CONNECTIONS

RISER DIAGRAM SYMBOLS

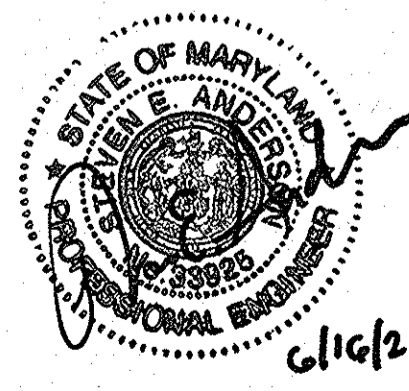
- ABC-123 ISA P&ID NUMBERS
- DISCRETE SIGNAL/CONDUIT
- ANALOG SIGNAL/CONDUIT
- ETHERNET COMMUNICATIONS

NOTE: FOR RISER DIAGRAM SYMBOLS SEE P&ID SYMBOLS AND EQUIPMENT SYMBOLS ON THIS SHEET.

AS-BUILT
DATE 12/2021

Jun 12, 2020 11:18pm User: Jordan.wife Path: C:\Users\Jordan.wife\Documents\AS-Built\AS-Built.dwg

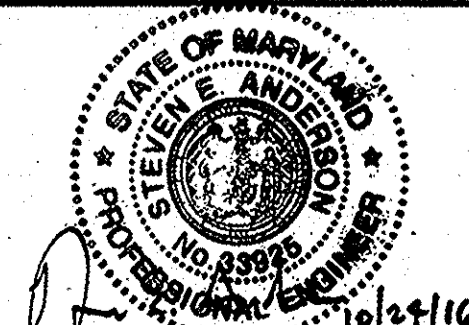
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33925 EXPIRATION DATE: 01/15/21



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 2/16/21
Chief, Bureau of Engineering: *[Signature]* 2/16/21
Chief, Bureau of Utilities: *[Signature]* 1/23/21
Chief, Utility Design Division: *[Signature]* 2/18/21

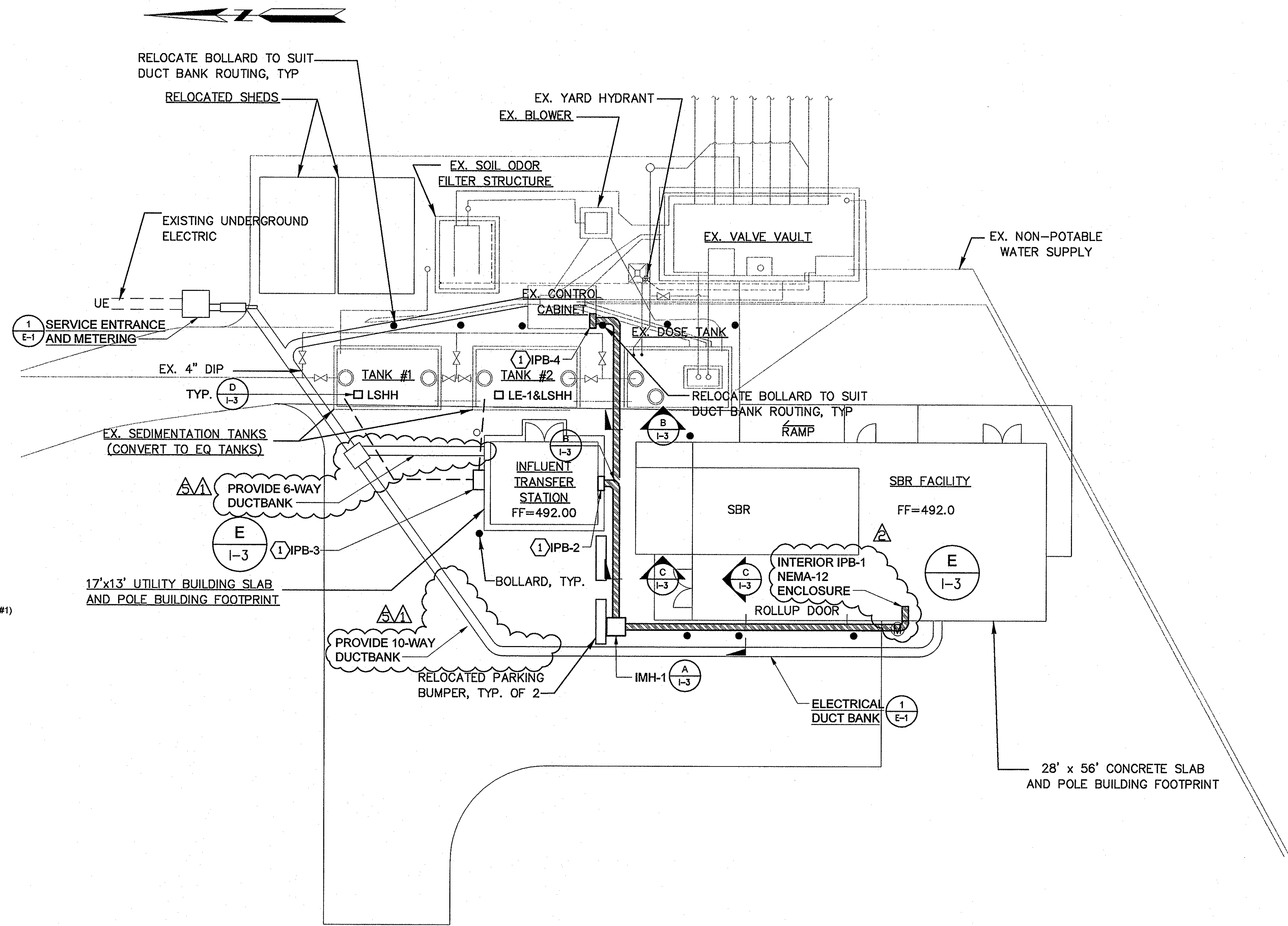
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DES: JFW									
DRN: JFW									
CHK: SEA									
DATE: AUG, 2016	BY	NO.	REVISION	DATE	60' SCALE MAP NO.	40-41	BLOCK NO.	12	

INSTRUMENTATION SYMBOLS

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND



CONSTRUCTION NOTES:

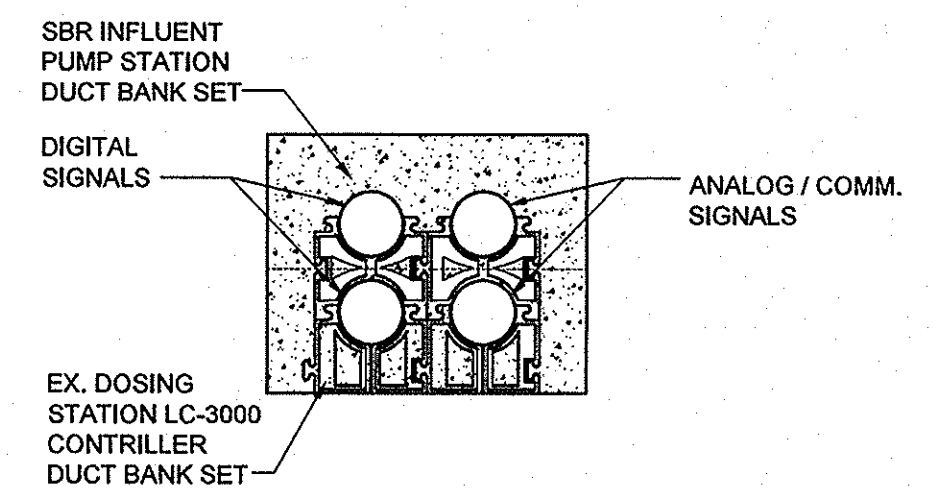
- ① INSTRUMENTATION PULL BOXES SHALL BE ABOVE GRADE NEMA-4X S.S. ENCLOSURES SIZED TO SUIT 2-WAY CONDUIT ENTRY FROM THE BOTTOM WITH BACK-PANEL EXIT INTO STRUCTURES SHOWN.
- ② SEE RISER DIAGRAMS FOR BURIED CONDUIT AND DUCT BANK CONDUCTOR QUANTITIES.

ABBREVIATIONS:

- IMH - INSTRUMENTATION MANHOLE
- IPB - INSTRUMENTATION PULL BOX
- UE - UNDERGROUND ELECTRIC

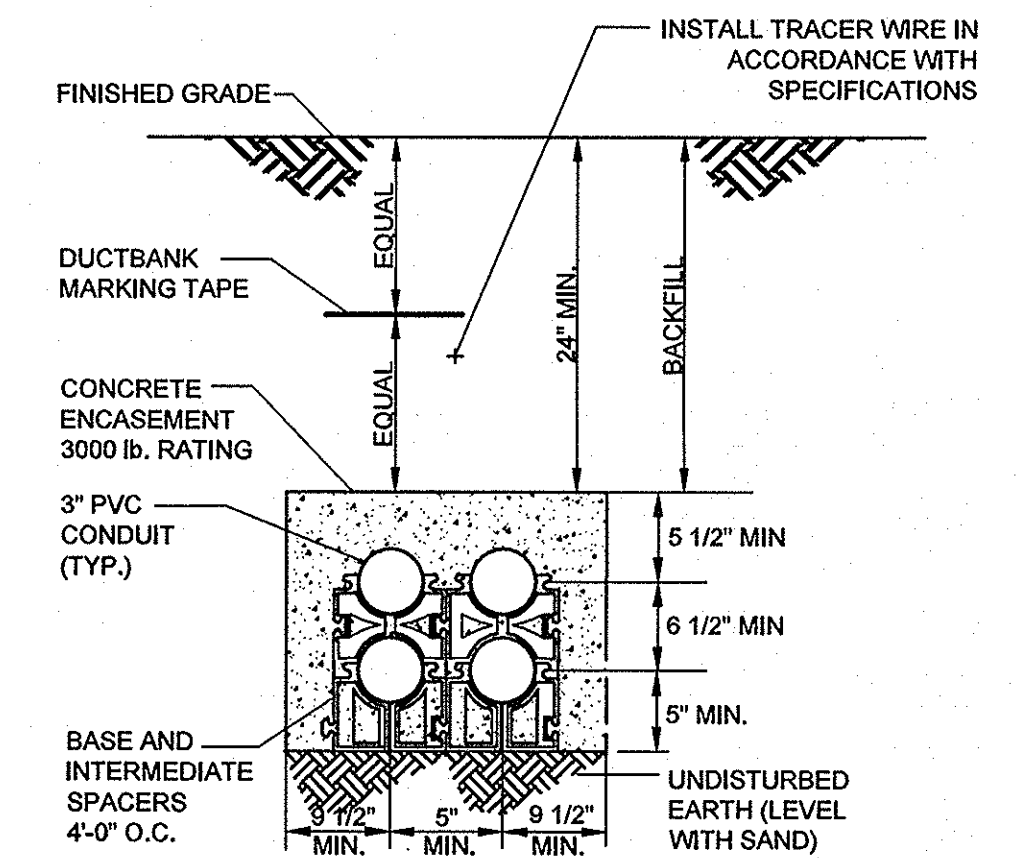
LEGEND

- EXISTING
- INSTRUMENTATION
- ▨ INSTRUMENTATION DUCT BANK

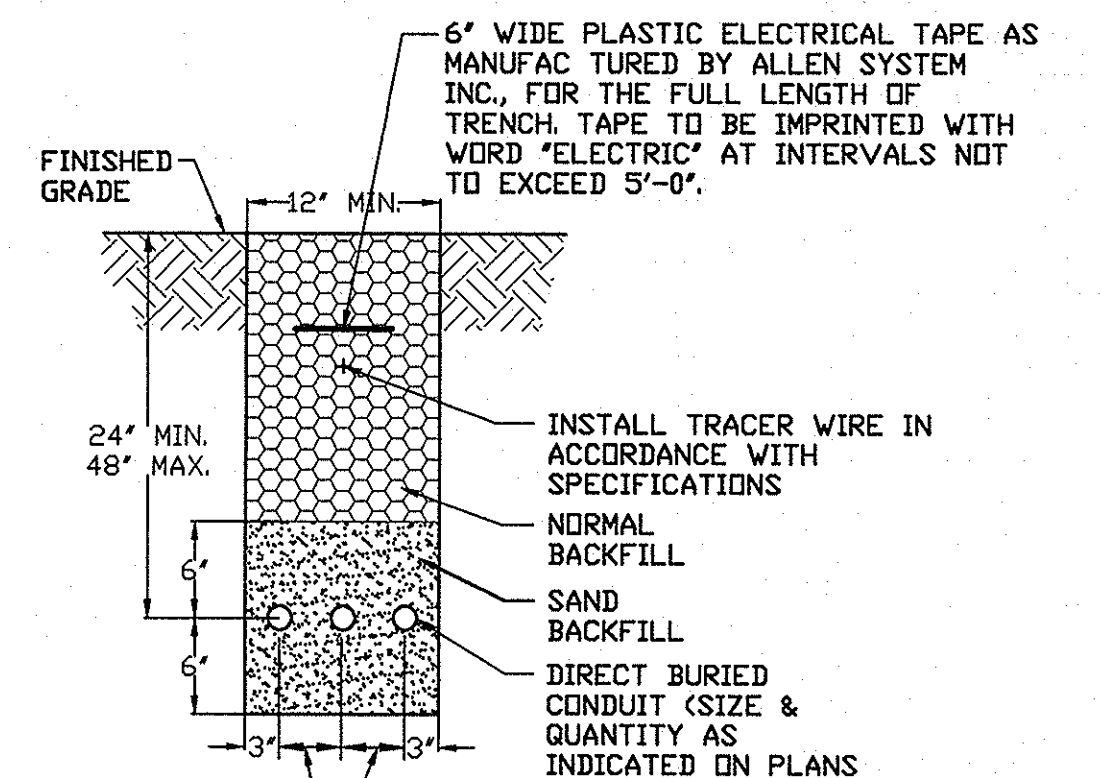


CONDUIT ASSIGNMENTS

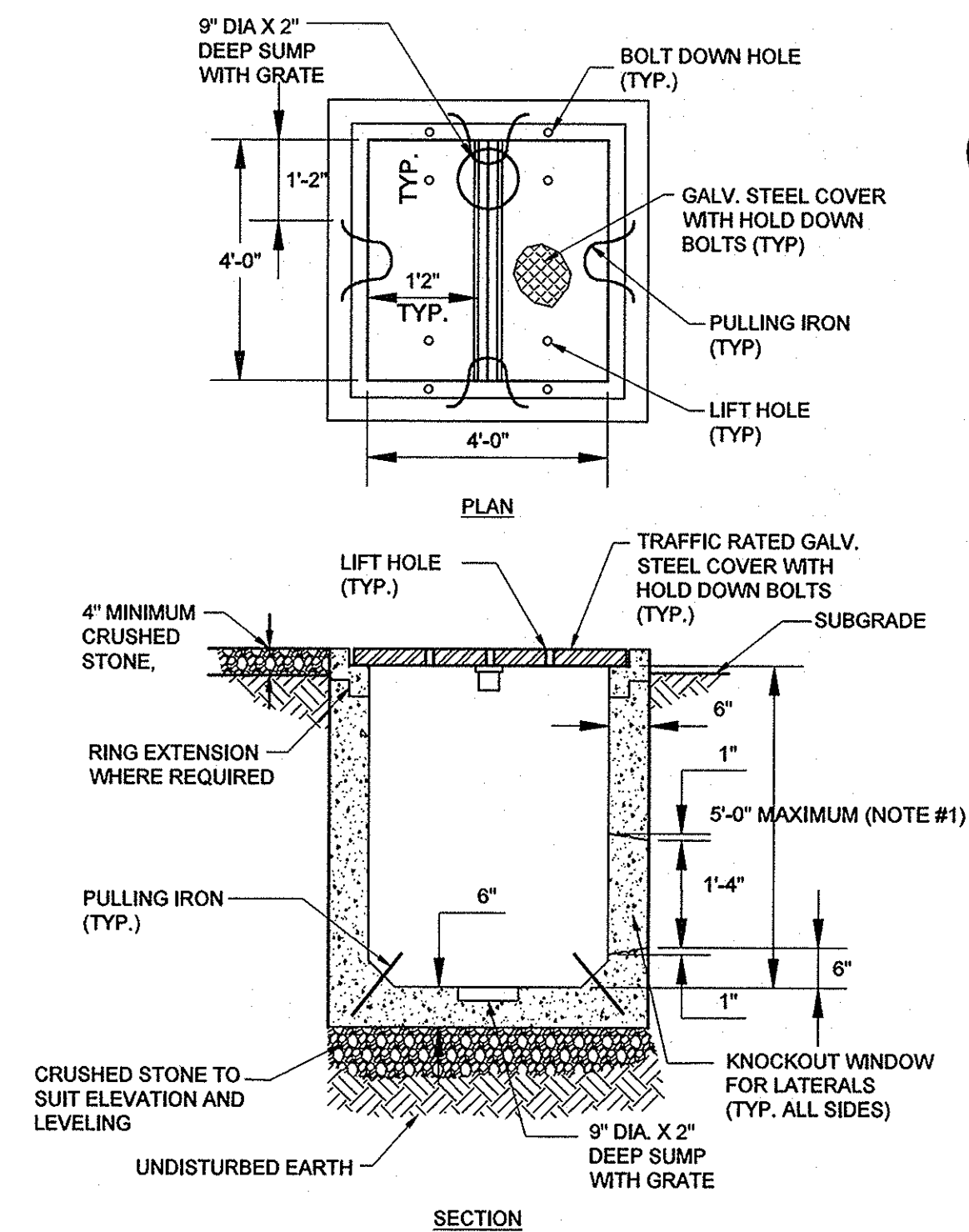
NOTE: SEE INSTRUMENT RISER DIAGRAM ON SHEET I-7.



C 4-WAY CONCRETE ENCASED DUCT BANK
SCALE: 1"=1'-0"

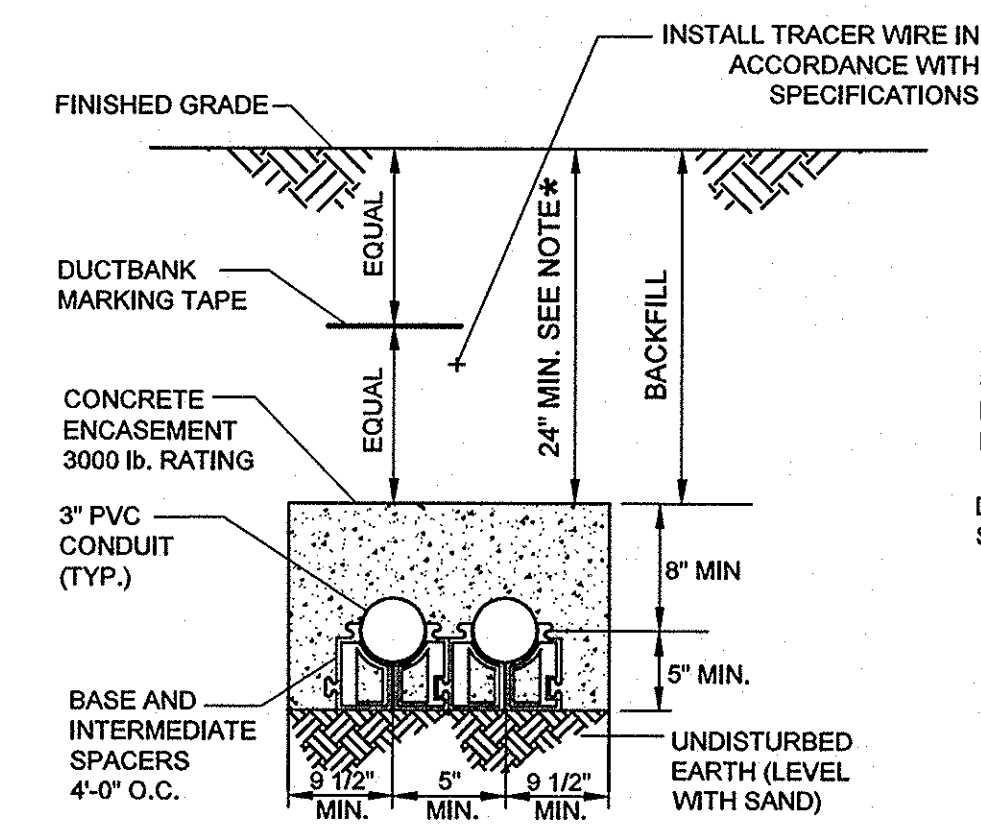


D DIRECT BURIED CONDUIT INSTALLATION DETAIL
SCALE: 1"=1'-0"

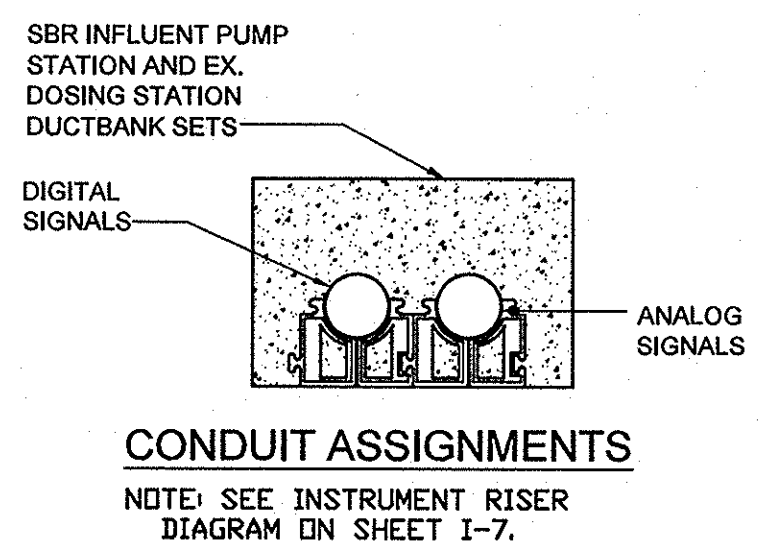


- NOTES:**
- 1. HANDHOLE SIZING TO SUIT PROPER INSTALLATION OF REQUIRED DUCTBANK PENETRATIONS.
 - 2. CONTRACTOR COORDINATE MANHOLE DEPTH TO SUIT FIELD ROUTING OF DUCTBANK.

A PRECAST INSTRUMENTATION MANHOLE DETAIL
SCALE: 1"=1'-0"

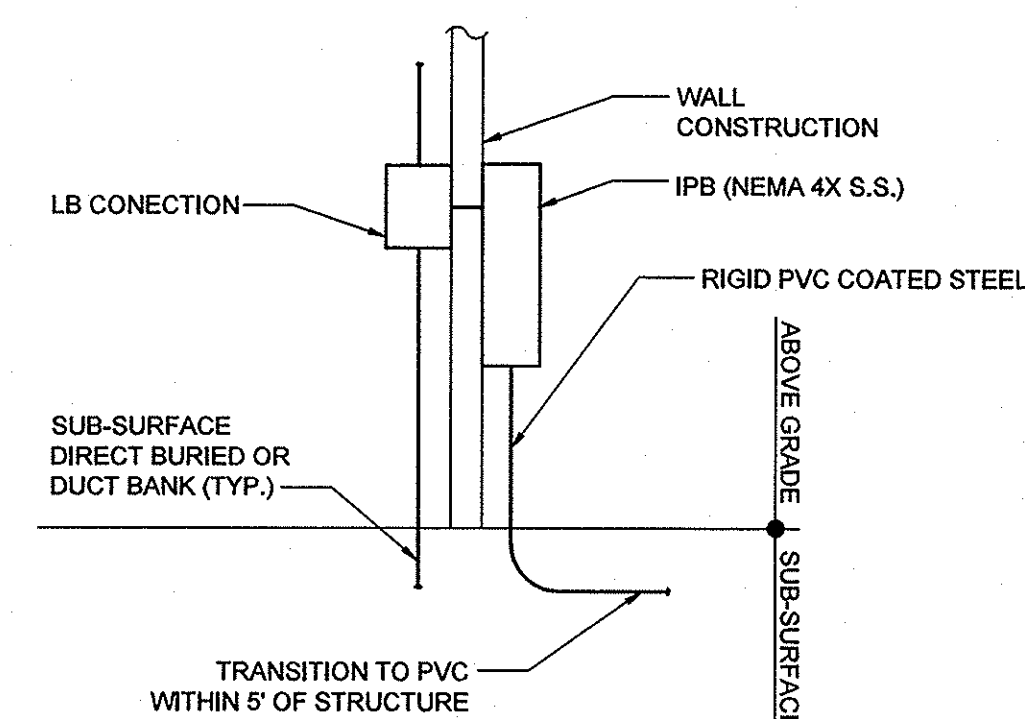


B 2-WAY CONCRETE ENCASED DUCT BANK
SCALE: 1"=1'-0"



CONDUIT ASSIGNMENTS
NOTE: SEE INSTRUMENT RISER DIAGRAM ON SHEET I-7.

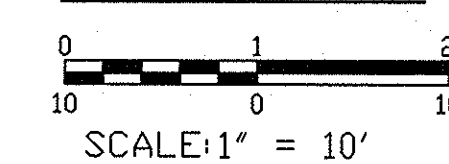
1 INSTRUMENTATION SITE PLAN
SCALE: 1"=10'-0"



E INSTRUMENT PULL BOX (IPB)
SCALE: NONE

**AS-BUILT
DATE 12/2021**

GRAPHIC SCALE



Jun 17, 2020 - 5:26pm User: jprodn.wolfe M:\2007\0191178\05\Drawings\I-05 SITE INSTRUMENTATION.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/17/21
DATE

[Signature] 2/17/21
DATE

CHIEF, BUREAU OF UTILITIES

CHIEF, UTILITY DESIGN DIVISION

KCI TECHNOLOGIES

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

936 RITCHIEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
Telephone: (410) 316-7800
Fax: (410) 316-7818
www.kci.com

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 31363, EXPIRATION DATE: 01/16/22

[Signature]
6/19/2020

DES:	JFW			
DRN:	JFW			
CHK:	SEA	JFW	ELECTRICAL DESIGN UPDATES	6/20
		JFW	ADDENDUM 1	6/20
DATE:	AUG, 2016	GW	NOVEMBER 21, 2018	
BY:	NO.			

INSTRUMENTATION SITE PLAN

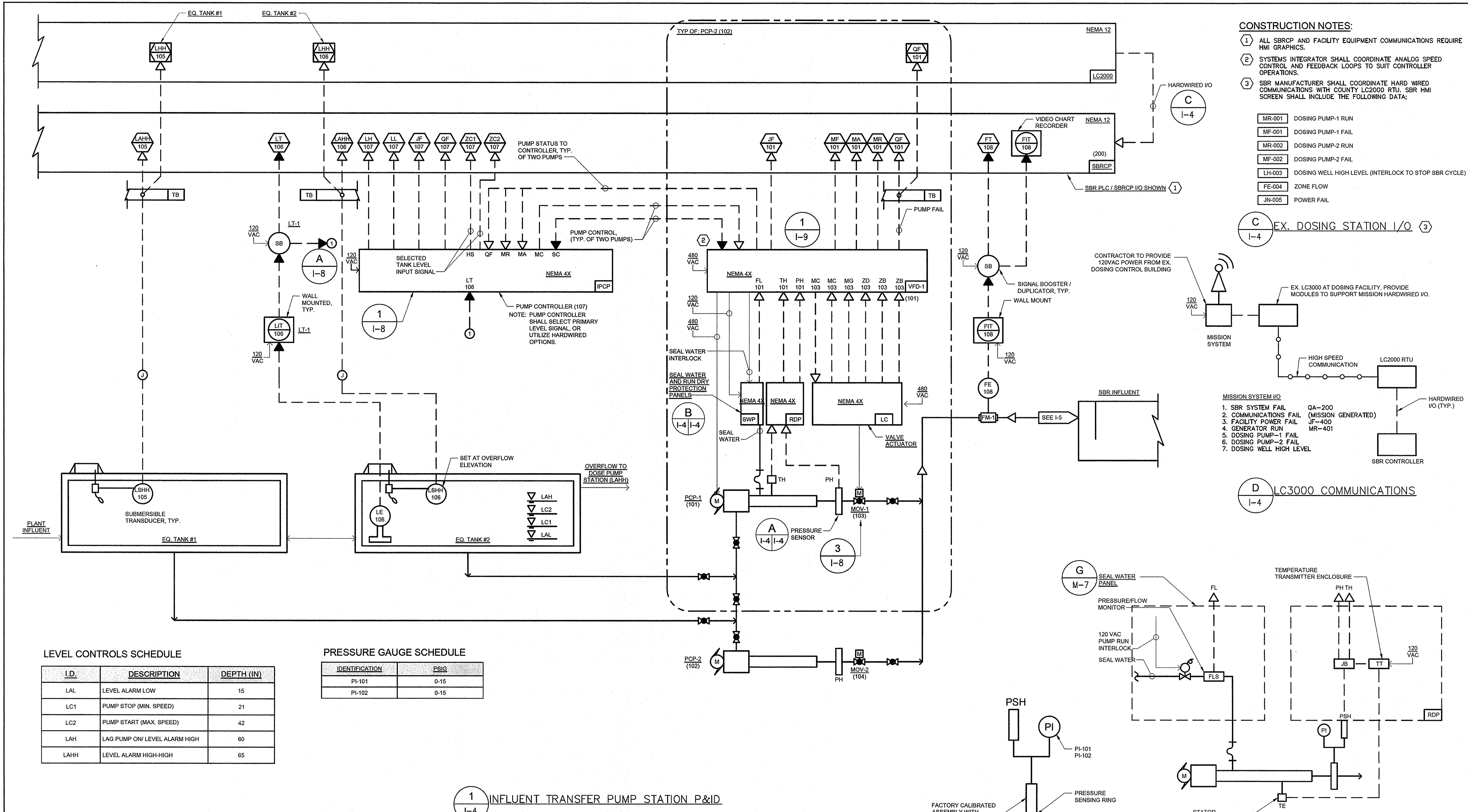
600' SCALE MAP NO. 40-41 BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

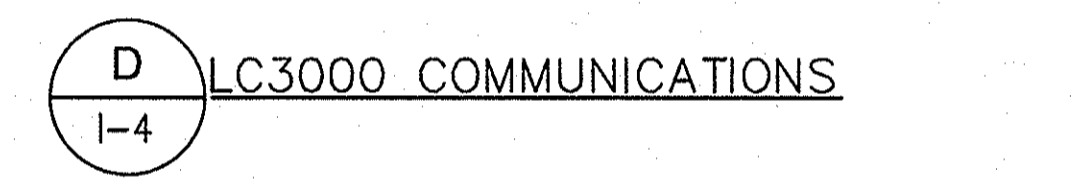
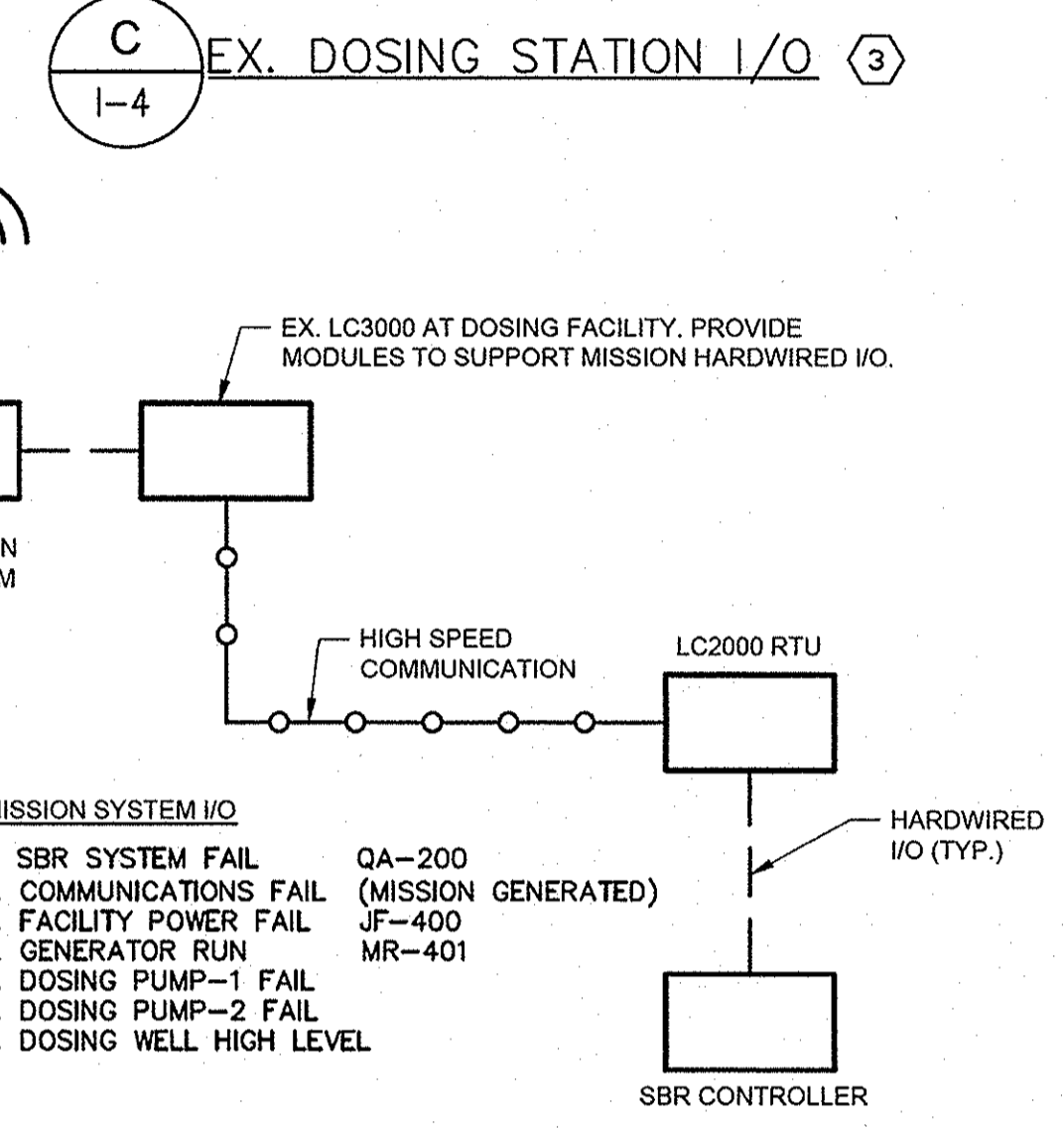
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

I-3
SCALE AS SHOWN
SHEET
33 OF 43



- CONSTRUCTION NOTES:**
- ALL SBRCP AND FACILITY EQUIPMENT COMMUNICATIONS REQUIRE HMI GRAPHICS.
 - SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SPEED CONTROL AND FEEDBACK LOOPS TO SUIT CONTROLLER OPERATIONS.
 - SBR MANUFACTURER SHALL COORDINATE HARD WIRED COMMUNICATIONS WITH COUNTY LC2000 RTU. SBR HMI SCREEN SHALL INCLUDE THE FOLLOWING DATA:
 - MR-001 DOSING PUMP-1 RUN
 - MF-001 DOSING PUMP-1 FAIL
 - MR-002 DOSING PUMP-2 RUN
 - MF-002 DOSING PUMP-2 FAIL
 - LH-003 DOSING WELL HIGH LEVEL (INTERLOCK TO STOP SBR CYCLE)
 - FE-004 ZONE FLOW
 - JN-005 POWER FAIL



LEVEL CONTROLS SCHEDULE

I.D.	DESCRIPTION	DEPTH (IN)
LAL	LEVEL ALARM LOW	15
LC1	PUMP STOP (MIN. SPEED)	21
LC2	PUMP START (MAX. SPEED)	42
LAH	LAG PUMP ON/LEVEL ALARM HIGH	60
LAHH	LEVEL ALARM HIGH-HIGH	65

PRESSURE GAUGE SCHEDULE

IDENTIFICATION	PSIG
PI-101	0-15
PI-102	0-15

1 I-4 INFLUENT TRANSFER PUMP STATION P&ID

A I-4 DETAIL: PRESSURE SENSOR

B I-4 RUN DRY PROTECTION DETAIL

Jun 12, 2020 - 4:44pm User: jfwh.mcd
 P:\2020\01071378.dwg (Deming)\-04 TRANSFER PUMP P&ID.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Thomas E. Butler 2/6/17
CHIEF, BUREAU OF ENGINEERING

Thomas E. Butler 2/6/17
CHIEF, UTILITY DESIGN DIVISION

KCI TECHNOLOGIES
936 RIDGEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
WWW.KCI.COM

PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33925, EXPIRATION DATE: 01/15/21

6/14/20



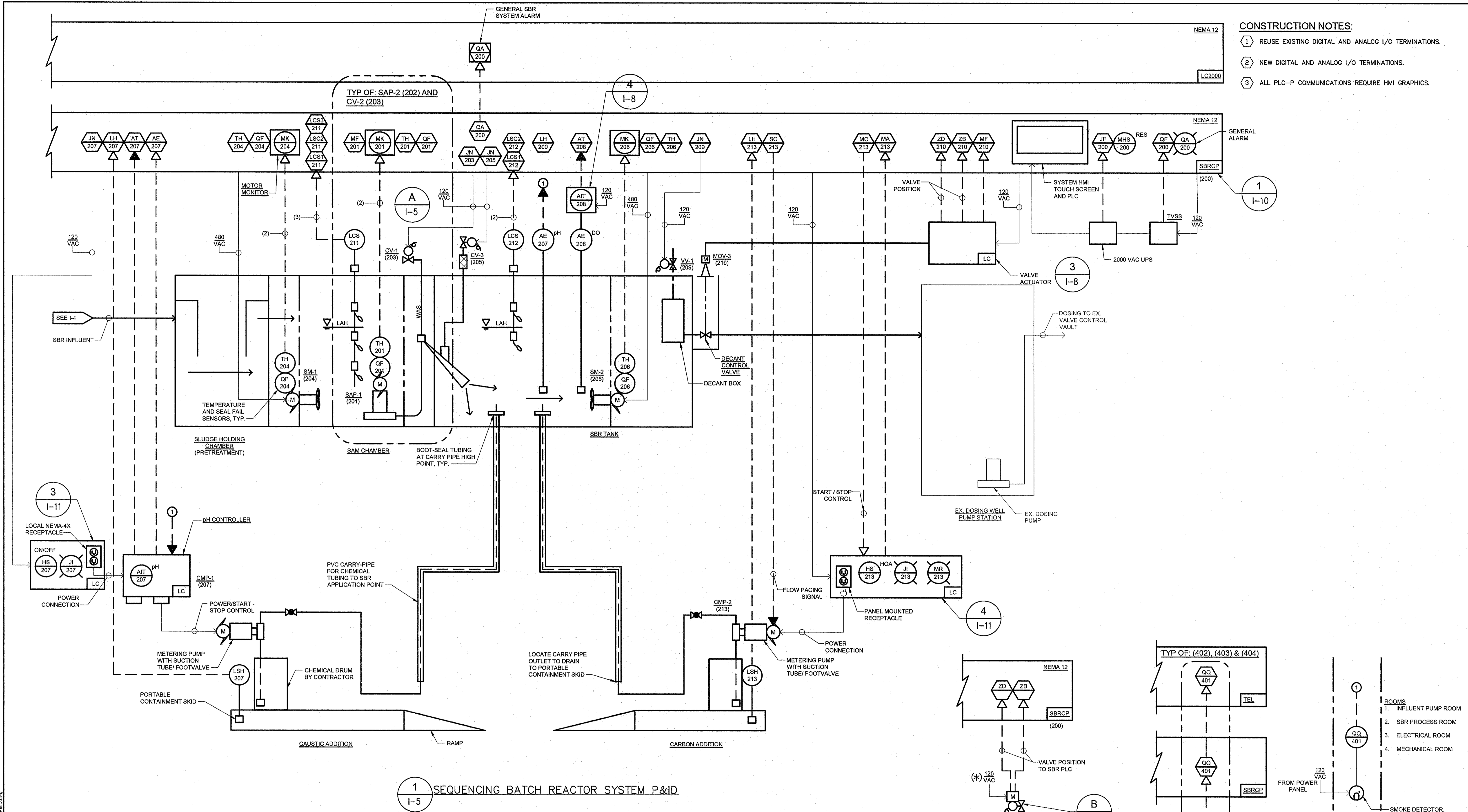
AS-BUILT
DATE 12/2021

DES: JFW	DATE: AUG, 2016
DRN: JFW	BY: NO.
CHK: SEA	REVISION
DATE: AUG, 2016	DATE: 600' SCALE MAP NO. 40-41 BLOCK NO. 12

INFLUENT TRANSFER PUMP STATION P&ID

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 34 OF 43

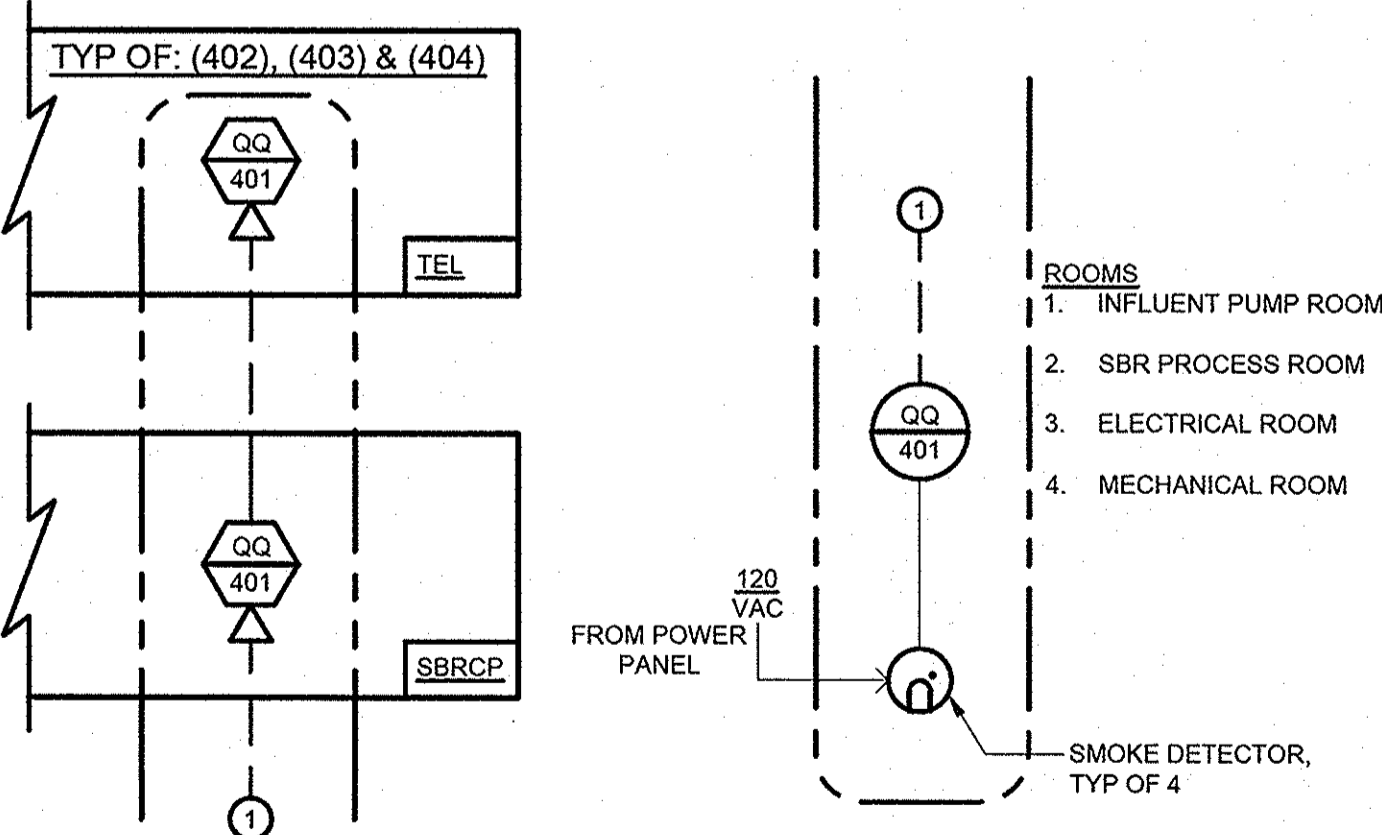


- CONSTRUCTION NOTES:**
- ① REUSE EXISTING DIGITAL AND ANALOG I/O TERMINATIONS.
 - ② NEW DIGITAL AND ANALOG I/O TERMINATIONS.
 - ③ ALL PLC-P COMMUNICATIONS REQUIRE HMI GRAPHICS.

1 I-5 SEQUENCING BATCH REACTOR SYSTEM P&ID

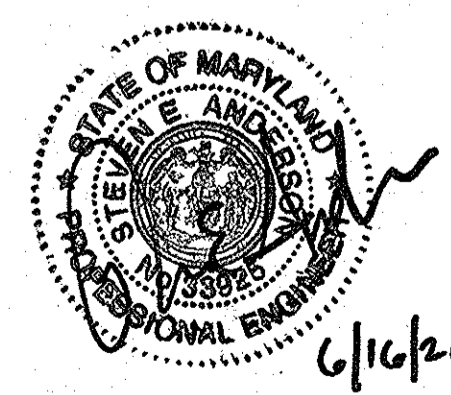
A I-5 TYPICAL CONTROL VALVE

B I-5 TYPICAL SMOKE DETECTOR



AS-BUILT
DATE 12/2021

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James E. Butler 2/17/17
CHIEF, BUREAU OF ENGINEERING
DATE 2/13/17

James E. Butler 2/17/17
CHIEF, UTILITY DESIGN DIVISION
DATE 2/13/17

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STATE OF MARYLAND
LICENSED PROFESSIONAL ENGINEER
NO. 63925
10/24/16

DES: JFW	DATE: AUG, 2016
DRN: JFW	BY: NO.
CHK: SEA	REVISION
DATE: AUG, 2016	DATE

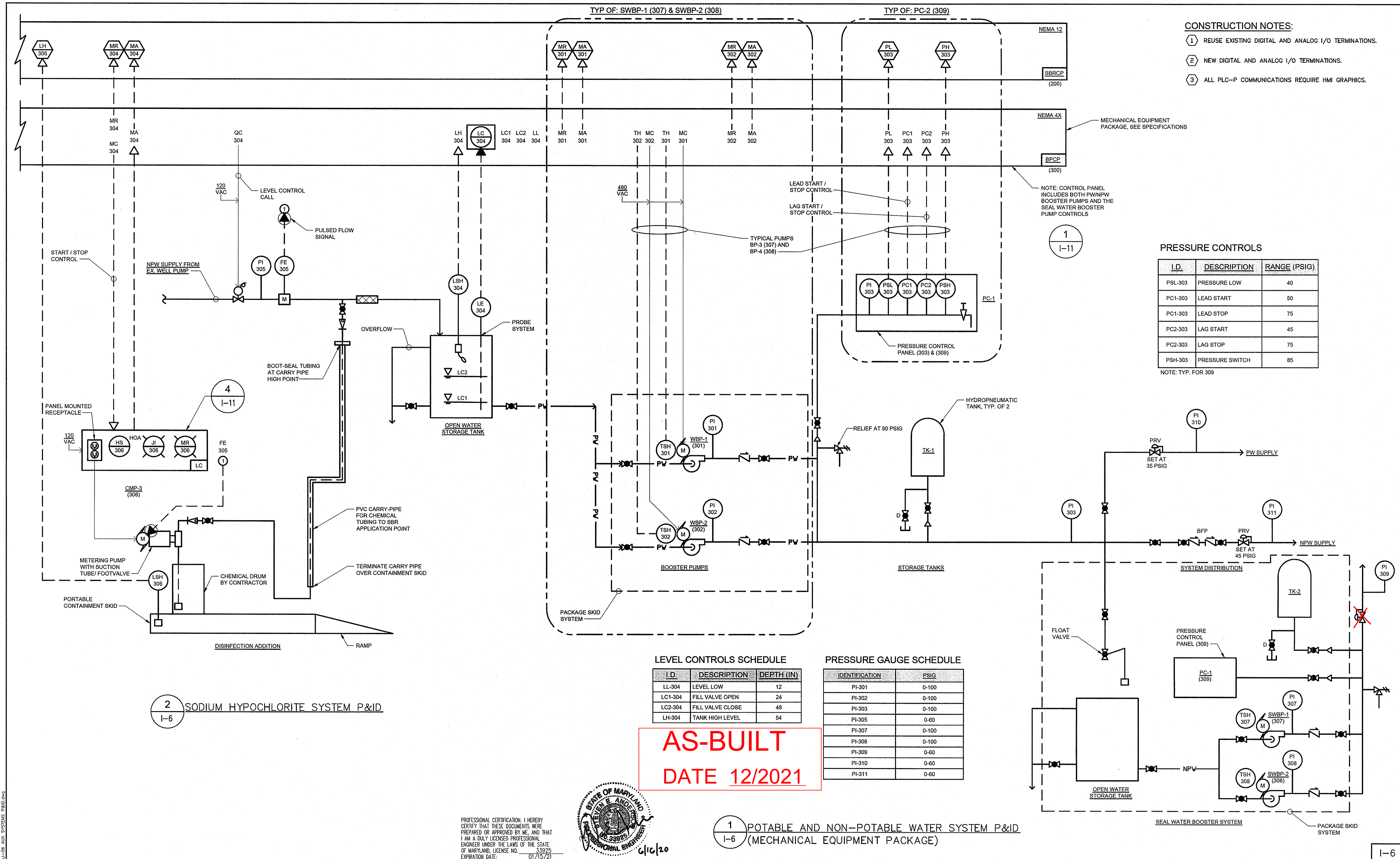
SEQUENCING BATCH REACTOR
P&ID

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 35 OF 43

Jan. 12, 2020 - 4:56pm User: jordan.mcfarlane
 M:\2020\01\07\1328\05\Drawings\I-05_SEQUENCING_BATCH_REACTOR_P&ID.dwg



- CONSTRUCTION NOTES:**
- 1 REUSE EXISTING DIGITAL AND ANALOG I/O TERMINATIONS.
 - 2 NEW DIGITAL AND ANALOG I/O TERMINATIONS.
 - 3 ALL PLC-P COMMUNICATIONS REQUIRE HMI GRAPHICS.

PRESSURE CONTROLS

I.D.	DESCRIPTION	RANGE (PSIG)
PSL-303	PRESSURE LOW	40
PC1-303	LEAD START	50
PC1-303	LEAD STOP	75
PC2-303	LAG START	45
PC2-303	LAG STOP	75
PSH-303	PRESSURE SWITCH	85

NOTE: TYP. FOR 309

LEVEL CONTROLS SCHEDULE

I.D.	DESCRIPTION	DEPTH (IN)
LL-304	LEVEL LOW	12
LC1-304	FILL VALVE OPEN	24
LC2-304	FILL VALVE CLOSE	48
LH-304	TANK HIGH LEVEL	54

PRESSURE GAUGE SCHEDULE

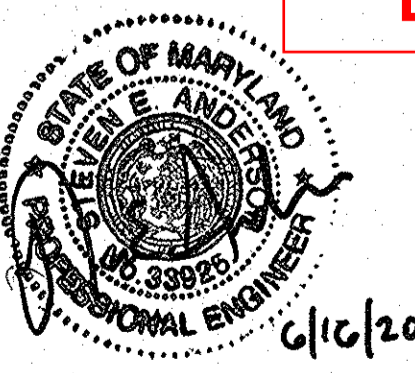
IDENTIFICATION	PSIG
PI-301	0-100
PI-302	0-100
PI-303	0-100
PI-305	0-60
PI-307	0-100
PI-308	0-100
PI-309	0-60
PI-310	0-60
PI-311	0-60

AS-BUILT
DATE 12/2021

2 SODIUM HYPOCHLORITE SYSTEM P&ID
I-6

1 POTABLE AND NON-POTABLE WATER SYSTEM P&ID
I-6 (MECHANICAL EQUIPMENT PACKAGE)

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 33925 EXPIRATION DATE: 07/15/21



Jun 12, 2020 4:59pm User: jordan.wells File: S:\031313262\Drawings\1-6 AS-BUILD P&ID.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John K... 2/6/17
DIRECTOR OF PUBLIC WORKS DATE

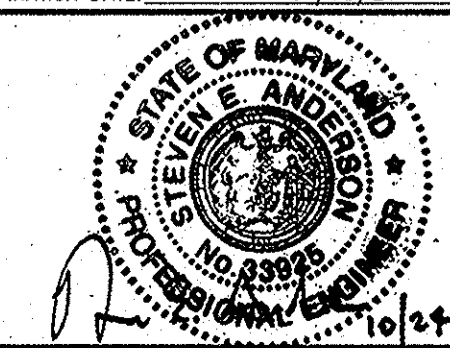
Thomas E. Butler 2/6/17
CHIEF, BUREAU OF ENGINEERING DATE

... 1/25/19
CHIEF, BUREAU OF UTILITIES DATE

... 2/18/17
CHIEF, UTILITY DESIGN DIVISION DATE

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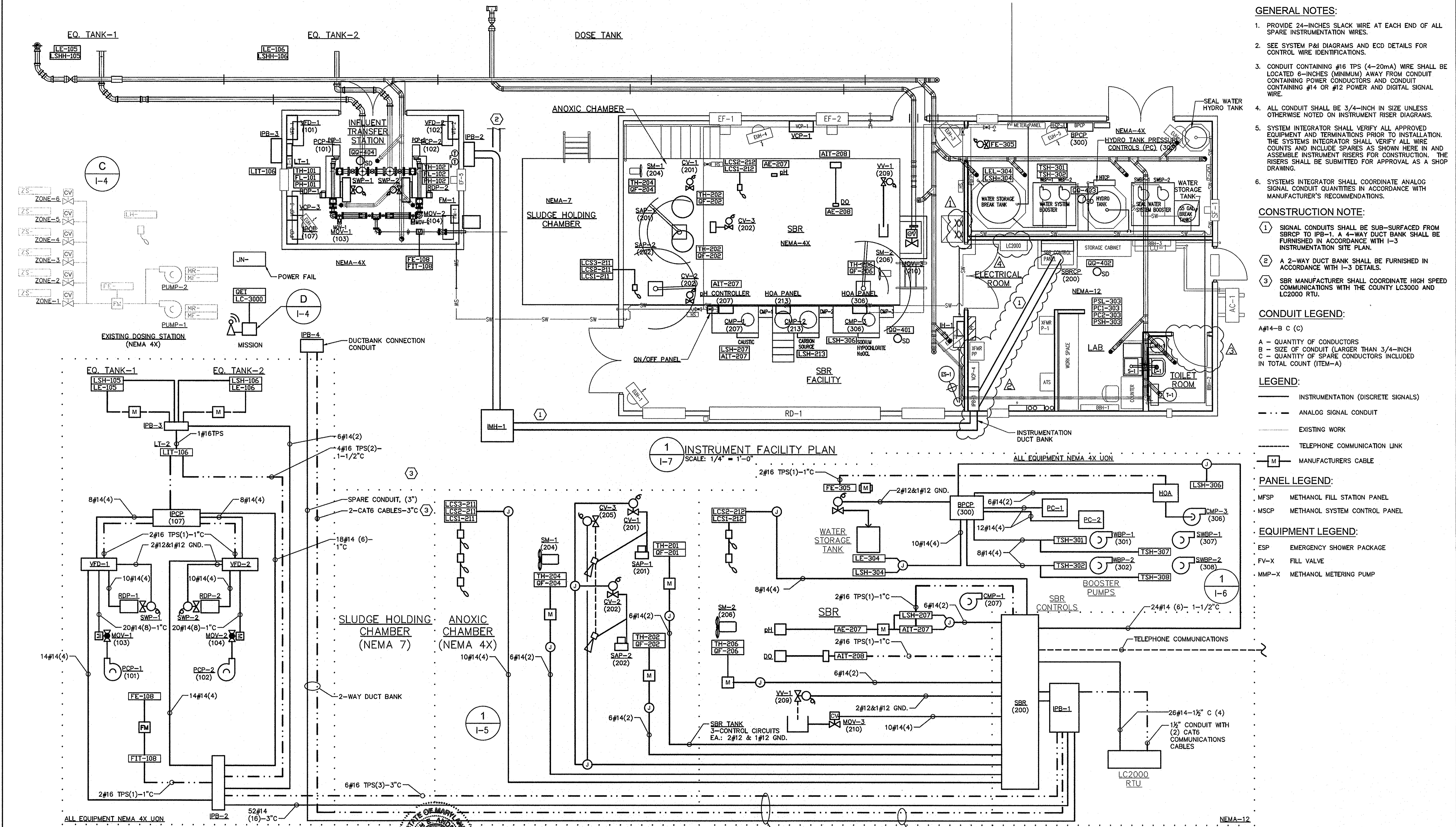
DES: JFW	BY NO.	REVISION
DRN: JFW		
CHK: SEA		
DATE: AUG, 2016		

AUXILIARY SYSTEMS P&ID

DATE: 600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

I-6
SCALE AS SHOWN
SHEET
36 OF 43



- GENERAL NOTES:**
- PROVIDE 24-INCHES SLACK WIRE AT EACH END OF ALL SPARE INSTRUMENTATION WIRES.
 - SEE SYSTEM P&I DIAGRAMS AND ECD DETAILS FOR CONTROL WIRE IDENTIFICATIONS.
 - CONDUIT CONTAINING #16 TPS (4-20mA) WIRE SHALL BE LOCATED 6-INCHES (MINIMUM) AWAY FROM CONDUIT CONTAINING POWER CONDUCTORS AND CONDUIT CONTAINING #14 OR #12 POWER AND DIGITAL SIGNAL WIRE.
 - ALL CONDUIT SHALL BE 3/4-INCH IN SIZE UNLESS OTHERWISE NOTED ON INSTRUMENT RISER DIAGRAMS.
 - SYSTEM INTEGRATOR SHALL VERIFY ALL APPROVED EQUIPMENT AND TERMINATIONS PRIOR TO INSTALLATION. THE SYSTEMS INTEGRATOR SHALL VERIFY ALL WIRE COUNTS AND INCLUDE SPARES AS SHOWN HERE IN AND ASSEMBLE INSTRUMENT RISERS FOR CONSTRUCTION. THE RISERS SHALL BE SUBMITTED FOR APPROVAL AS A SHOP DRAWING.
 - SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SIGNAL CONDUIT QUANTITIES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

- CONSTRUCTION NOTE:**
- SIGNAL CONDUITS SHALL BE SUB-SHALL BE LOCATED FROM SBRCOP TO IPB-1. A 4-WAY DUCT BANK SHALL BE FURNISHED IN ACCORDANCE WITH I-3 INSTRUMENTATION SITE PLAN.
 - A 2-WAY DUCT BANK SHALL BE FURNISHED IN ACCORDANCE WITH I-3 DETAILS.
 - SBR MANUFACTURER SHALL COORDINATE HIGH SPEED COMMUNICATIONS WITH THE COUNTY LC3000 AND LC2000 RTU.

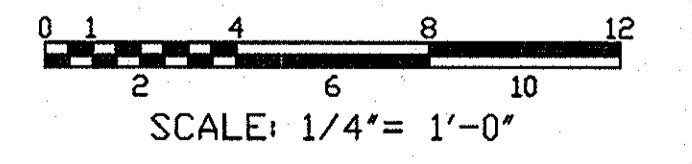
CONDUIT LEGEND:
 A#14-B C (C)
 A - QUANTITY OF CONDUCTORS
 B - SIZE OF CONDUIT (LARGER THAN 3/4-INCH
 C - QUANTITY OF SPARE CONDUCTORS INCLUDED IN TOTAL COUNT (ITEM-A)

LEGEND:
 — INSTRUMENTATION (DISCRETE SIGNALS)
 - - - ANALOG SIGNAL CONDUIT
 - - - EXISTING WORK
 - - - TELEPHONE COMMUNICATION LINK
 M - MANUFACTURER'S CABLE

PANEL LEGEND:
 MFSF METHANOL FILL STATION PANEL
 MSCP METHANOL SYSTEM CONTROL PANEL

EQUIPMENT LEGEND:
 ESP EMERGENCY SHOWER PACKAGE
 FV-X FILL VALVE
 MMP-X METHANOL METERING PUMP

AS-BUILT
DATE 12/2021



STATE OF MARYLAND PROFESSIONAL ENGINEER
 PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33925 EXPIRATION DATE: 01/15/21
 6/16/20

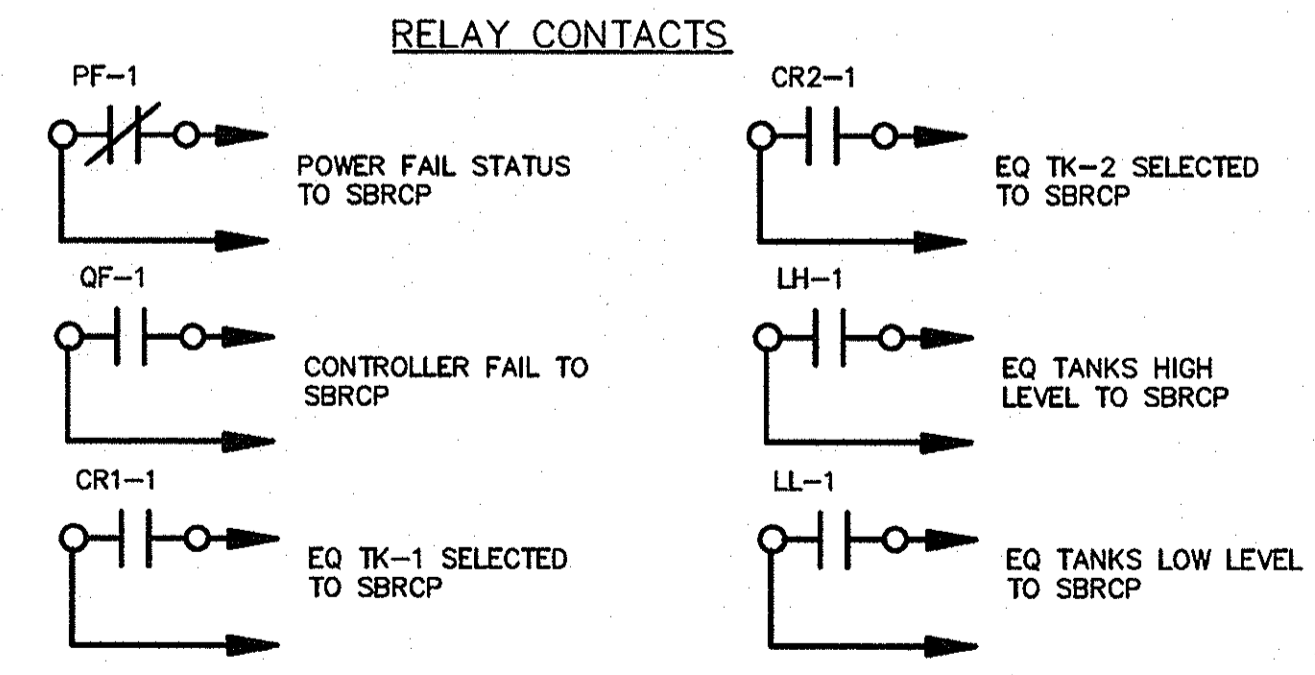
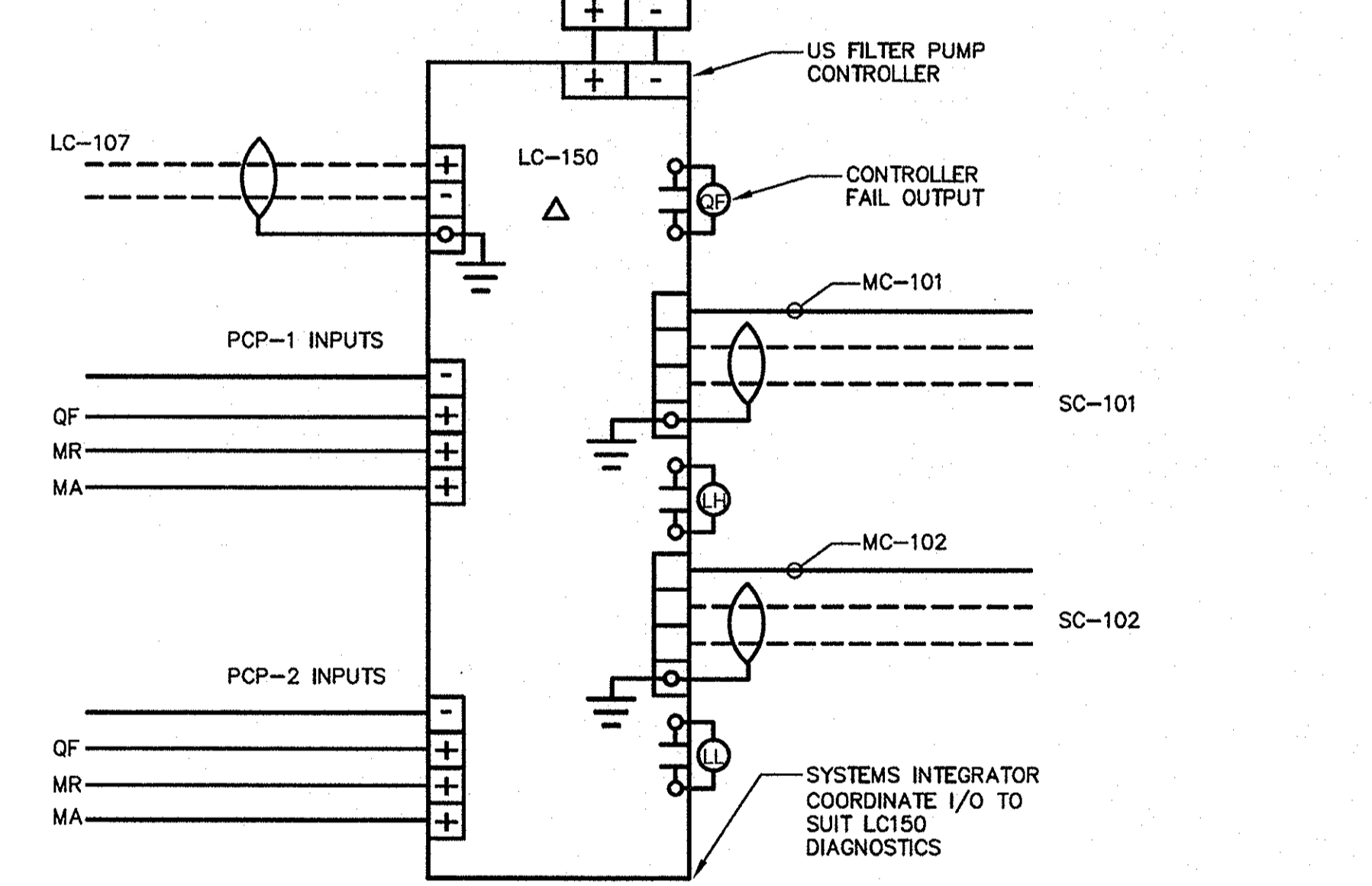
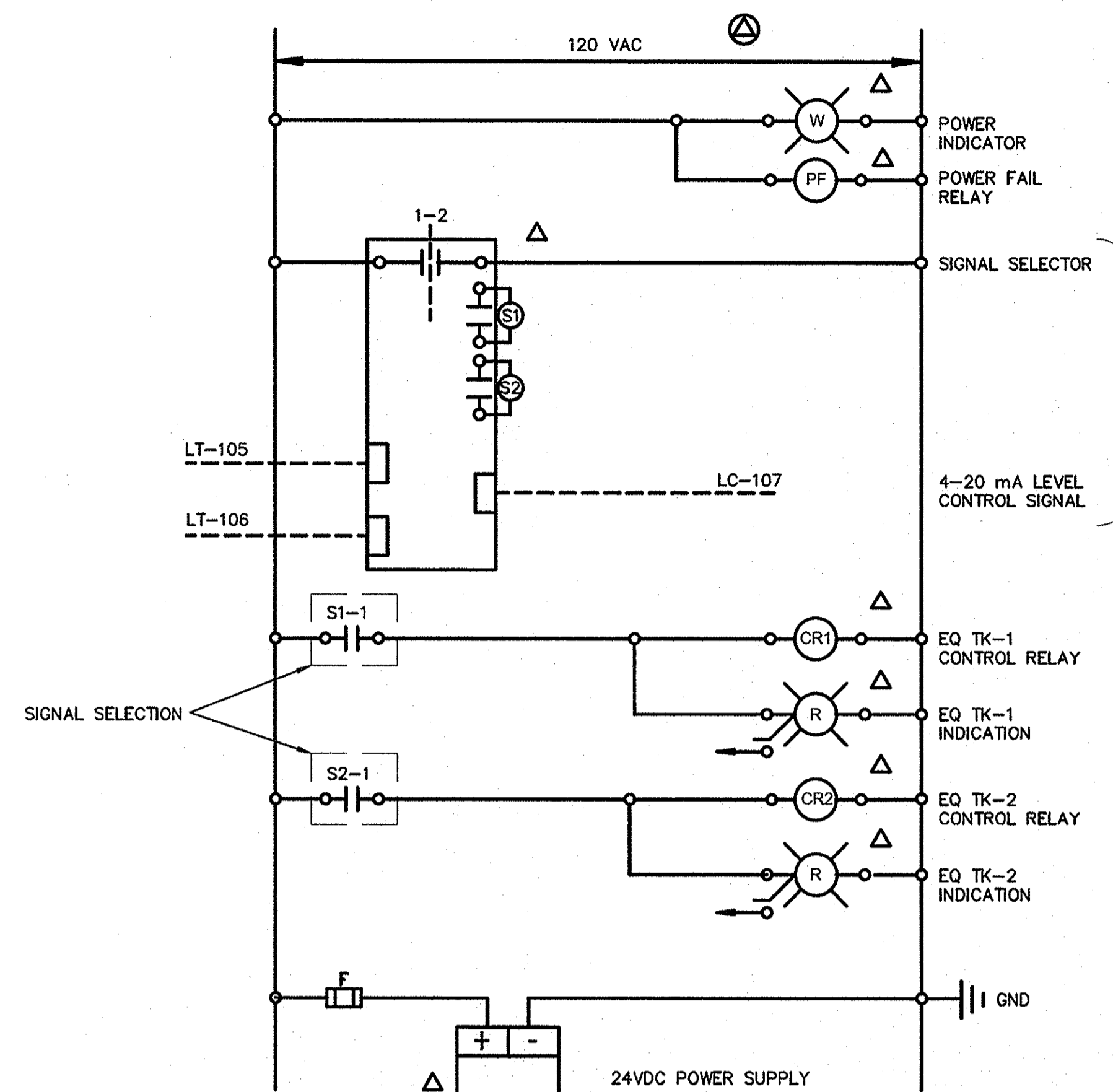
DES:	JFW	DATE:	AUG, 2016
DRN:	JFW	RFI #002	6/20
CHK:	SEA	BUILDING PERMIT COMMENTS - HO. CO. DILP	6/20
	JFW	ADDENDUM 1	6/20
DATE:	GW	NOVEMBER 21, 2018	
BY:	NO.	REVISION	

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: *[Signature]* DATE: 2/6/17
 Chief, Bureau of Utilities: *[Signature]* DATE: 1/25/17

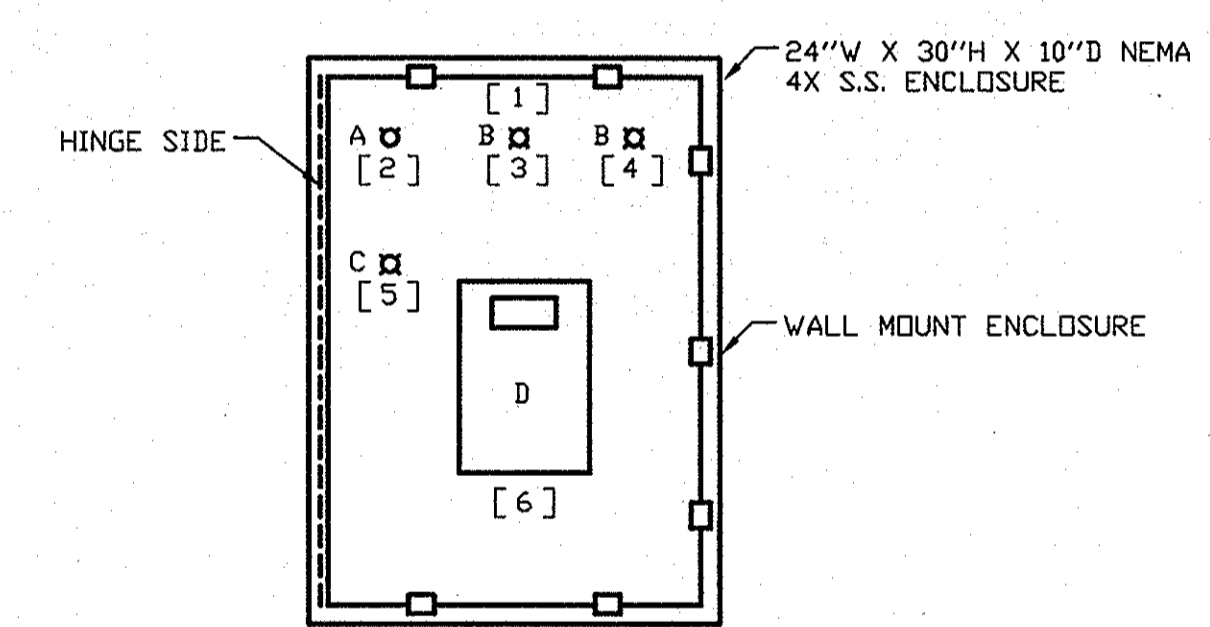
ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
KCI TECHNOLOGIES
 936 Rockledge Road
 Sparks, Maryland 21152
 Telephone: (410) 316-7800
 Fax: (410) 316-7818
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STATE OF MARYLAND PROFESSIONAL ENGINEER
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 10/24/16

INSTRUMENT PLAN AND RISER DETAILS
 ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND
 SCALE AS SHOWN
 SHEET 37 OF 43



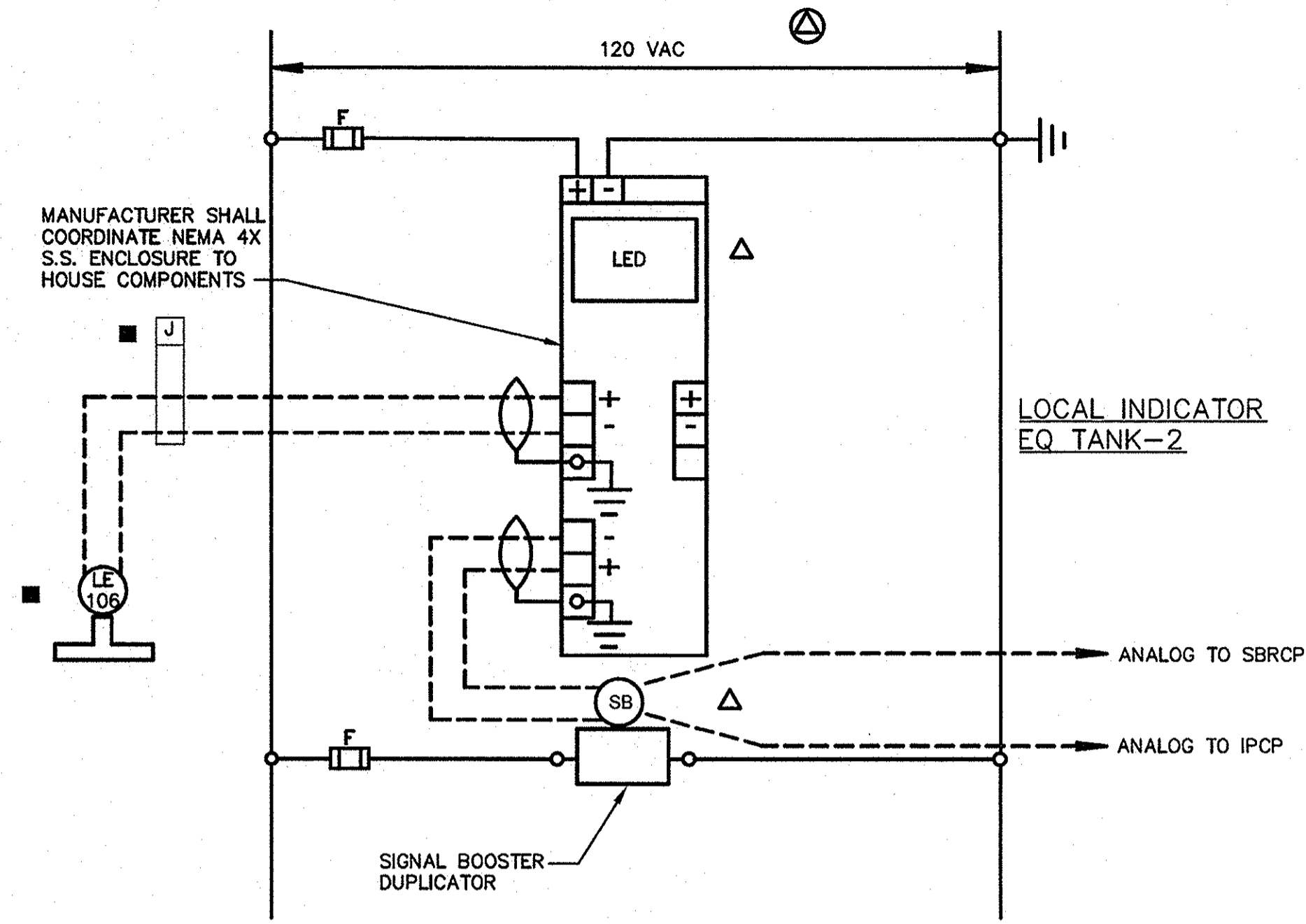
1 IPCP DIAGRAM
1-8



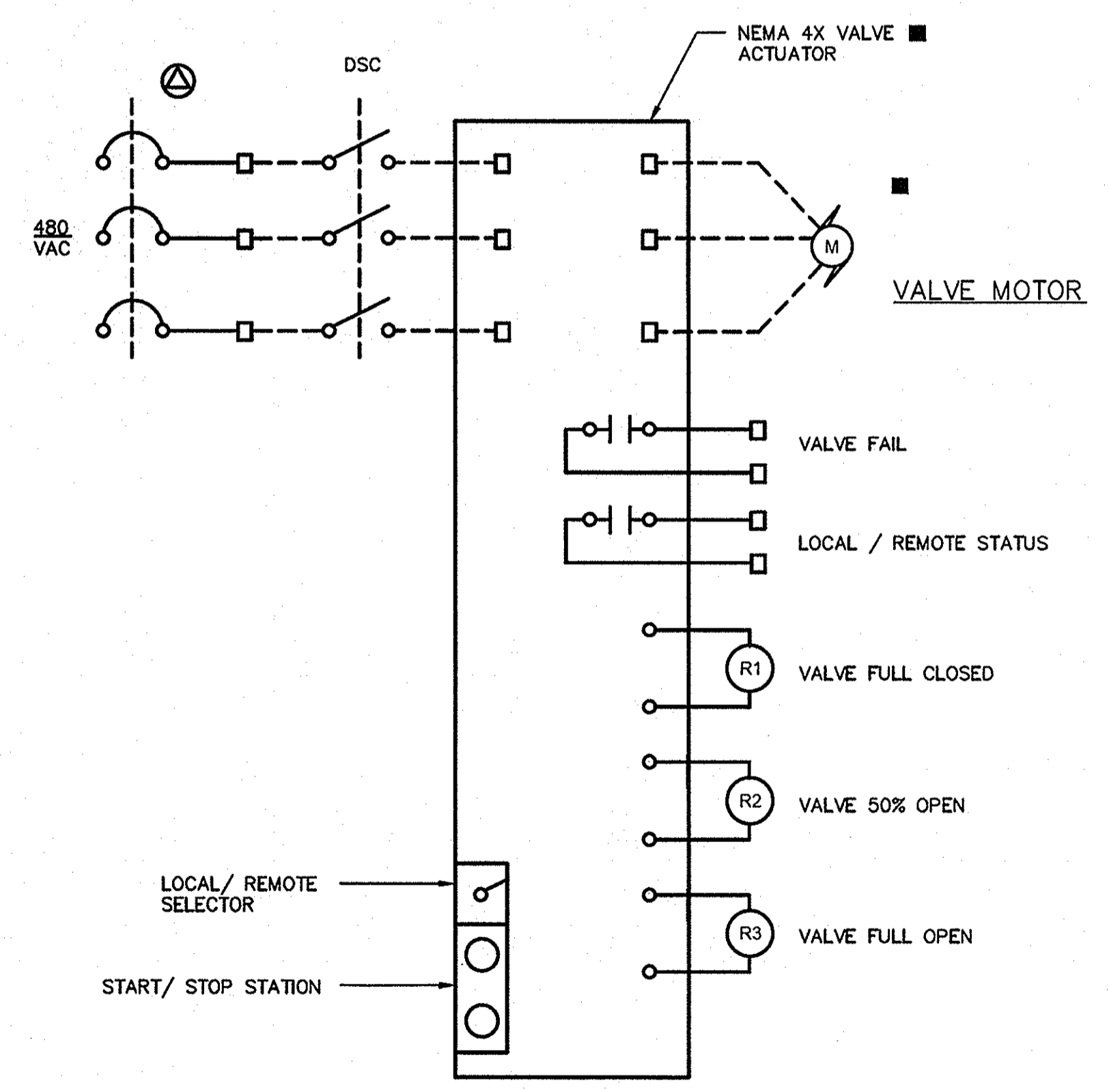
- DEVICE LEGEND**
- A 2-POSITION SELECTOR SWITCH
 - B INDICATOR LAMP (RED)
 - C INDICATOR LAMP (WHITE)
 - D LC150 CONTROLLER
- NAMEPLATE LEGEND**
- 1 INFLUENT PUMP CONTROL PANEL
 - 2 EQ TANK SELECTOR
 - 3 EQ TANK-1
 - 4 EQ TANK-2
 - 5 POWER IND.
 - 6 PUMP CONTROLLER

A IPCP ELEVATION
1-8 SCALE 1 - 1/2" = 1'-0"

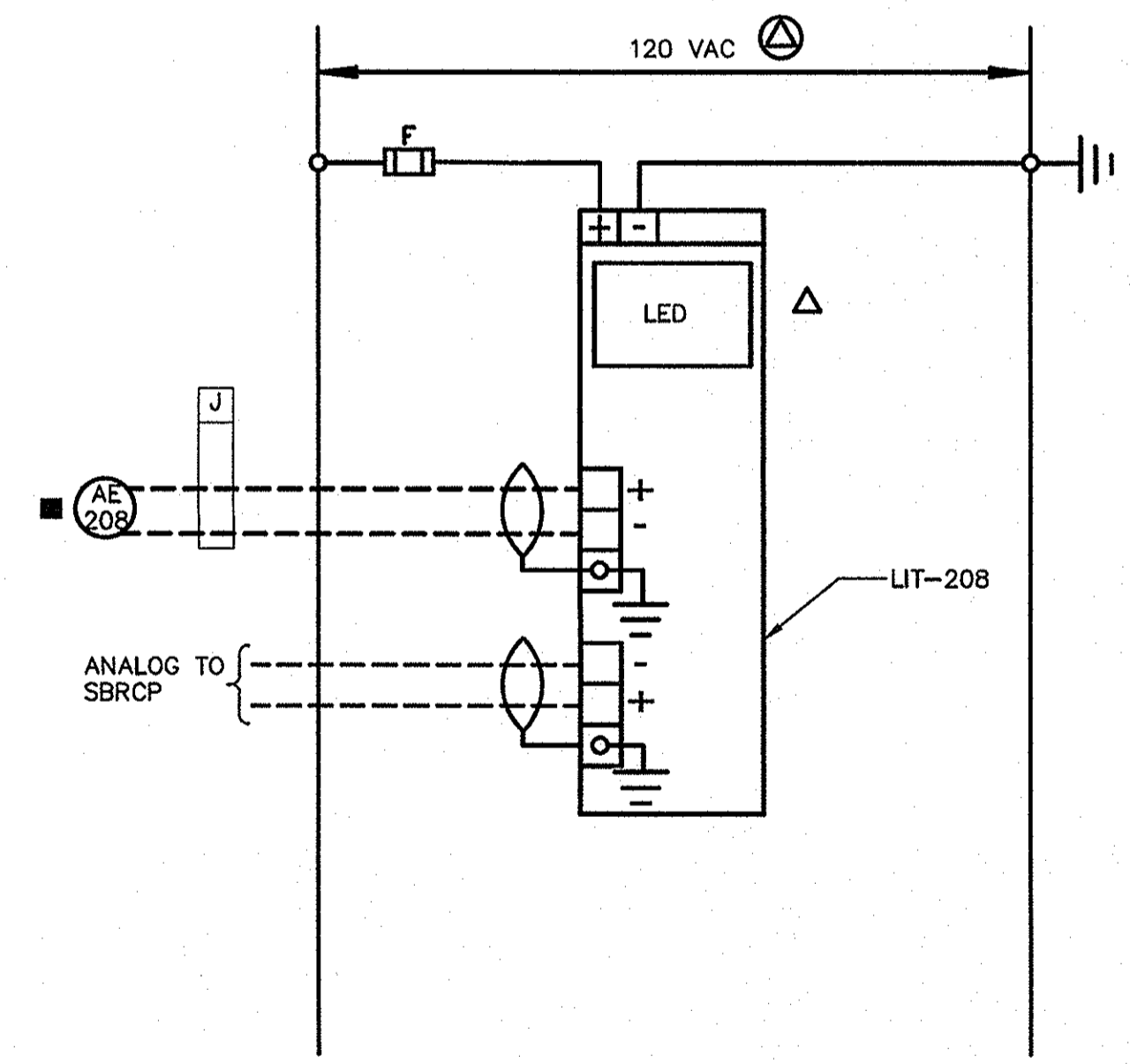
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 33925 EXPIRATION DATE: 07/15/21



2 TRANSMITTER DETAIL (LT-1)
1-8



3 TYPICAL MOTOR OPERATED VALVE (MOV)
1-8



4 DO-ANALYZER
1-8 TYPICAL: LT-1(105)

- GENERAL NOTES:**
- SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
- CONSTRUCTION NOTES:**
- ALL RELAYS SHALL HAVE L.E.D.S.
 - ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
 - VFD SHALL SELECT 4-20mA SPEED REFERENCE INPUT BASED ON HIGH/ LOW CURRENT VALVE. PLC-IP1 SHALL BE PRIMARY AND PLC-IP2 SHALL BE SECONDARY. SYSTEMS INTEGRATOR COORDINATE VFD PROGRAMMING FOR CURRENT LEVEL SELECTION OR DIGITAL ONLINE STATUS FROM PLC-IP1 AND PLC-IP2.
 - ALL SBRCP COMMUNICATIONS REQUIRE HMI GRAPHICS.
 - SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SPEED CONTROL AND FEEDBACK LOOPS TO SUIT CONTROLLER OPERATIONS.

- ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):**
- REMOTE
 - AT PLC CABINET
 - △ AT LOCAL PANEL
 - ▲ AT MOTOR CONTROL PANEL (VFD)
 - ⊙ PANEL BOARD
 - ⊕ AT SYSTEM CONTROL PANEL
- ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):**
- PANEL WIREWAY TERMINATIONS
 - WIRING CONNECTIONS
 - REMOTE TERMINATIONS
 - PANEL CONNECTIONS
 - - - REMOTE CONNECTIONS
 - ⊕ POWER SUPPLY CONNECTION

AS-BUILT
DATE 12/2021

16. 2020 - 11/17/2021 User: jrd@ashleight.com

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James E. Kautler 2/17/21
CHIEF, BUREAU OF ENGINEERING

Thomas E. Kautler 2/17/21
CHIEF, UTILITY DESIGN DIVISION

KCI TECHNOLOGIES
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Fax: (410) 316-7818
www.kci.com

STATE OF MARYLAND
LICENSED PROFESSIONAL ENGINEER
NO. 33925
EXPIRES 07/15/21

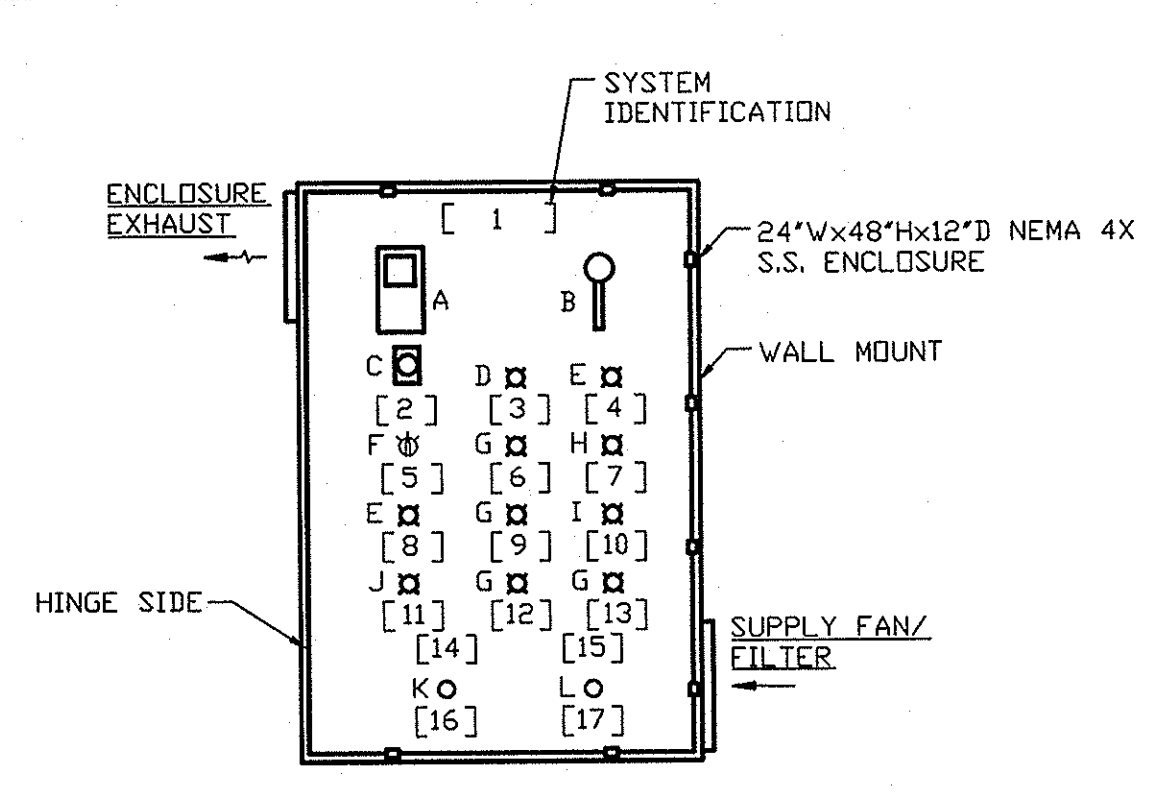
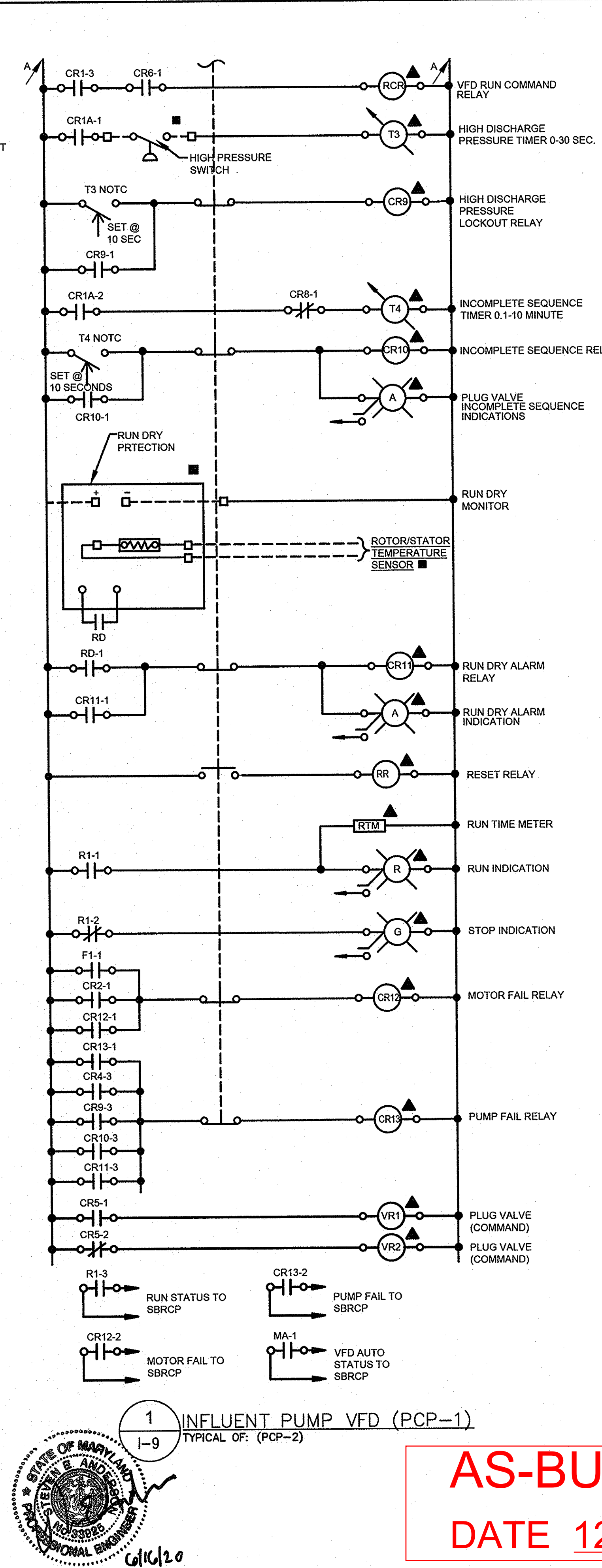
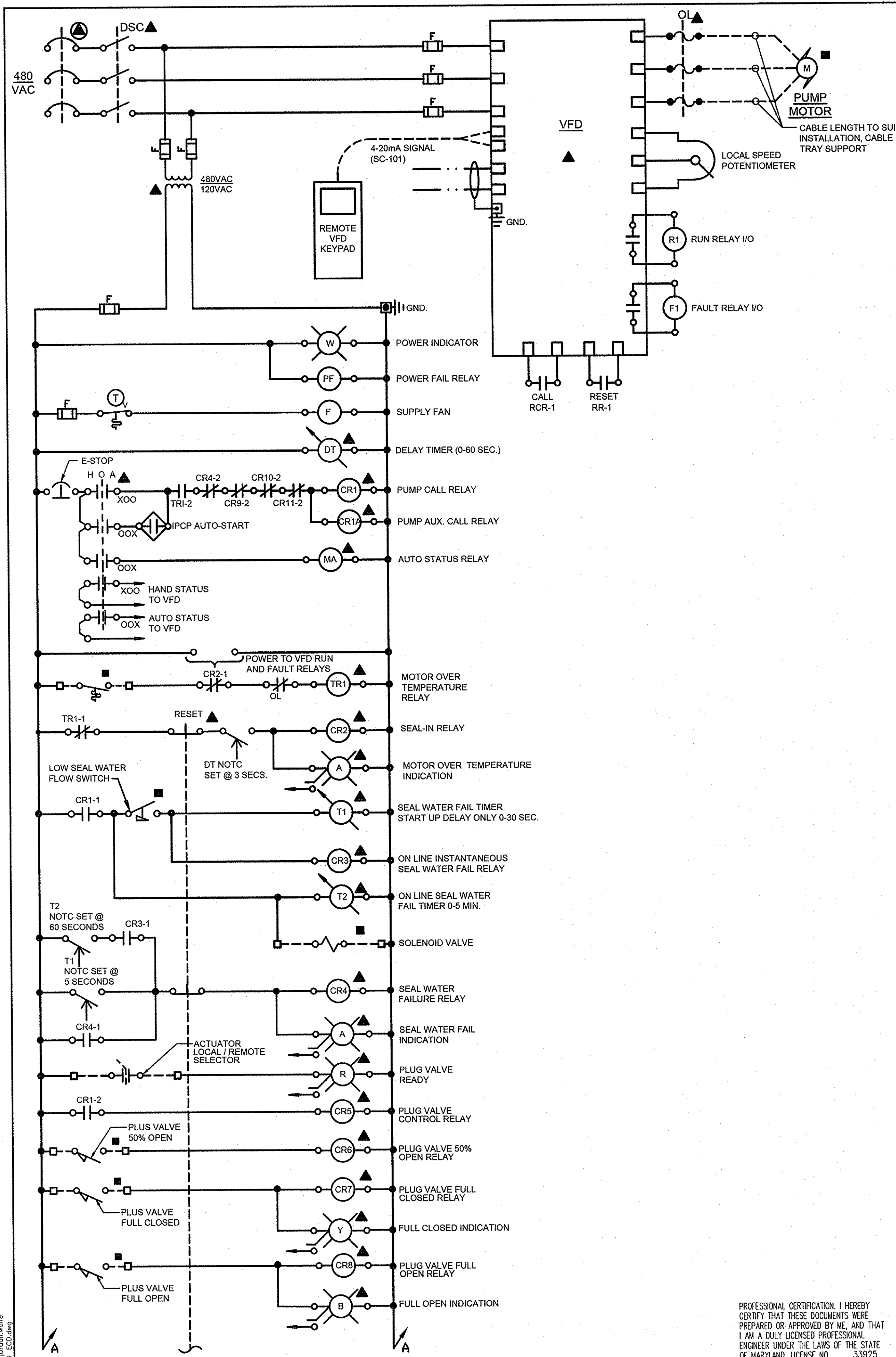
DES: JFW	BY NO.	REVISION	DATE
DRN: JFW			
CHK: SEA			
DATE: AUG, 2016			

WIRING DIAGRAM - 1

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-8
SCALE AS SHOWN
SHEET
38 OF 43



NAMEPLATE LEGEND:

1	INFLUENT PUMP VFD-1
2	RUN-HOURS
3	POWER
4	VALVE READY
5	HOA
6	MOTOR FAIL
7	VALVE CLOSED
8	PUMP RUN
9	SEAL-WATER FAIL
10	VALVE OPEN
11	PUMP STOP
12	RUN DRY ALARM
13	INCOMPLETE SEQUENCE
14	VFD
15	MOTORIZED PLUG VALVE
16	RESET
17	E-STOP

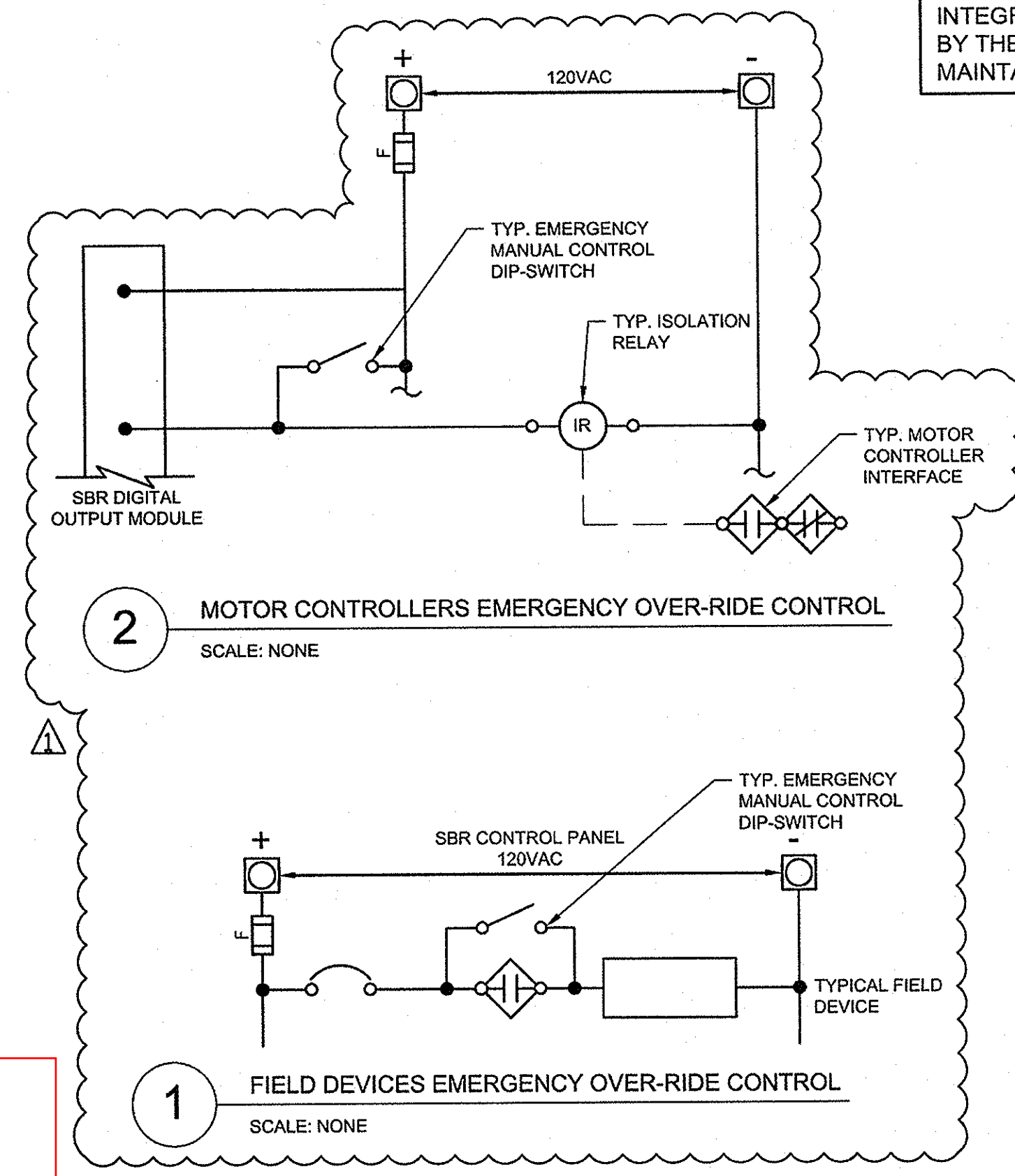
DEVICE LEGEND:

A	VFD KEYPAD
B	MAIN BREAKER
C	ETM-ELAPSED TIME METER
D	IND. LAMP (WHITE)
E	IND. LAMP (RED)
F	3-POSITION SELECTOR SWITCH
G	IND. LAMP (AMBER)
H	IND. LAMP (YELLOW)
I	IND. LAMP (BLUE)
J	IND. LAMP (GREEN)
K	MOMENTARY PUSHBUTTON
L	MAINTAIN PUSH-PULL BUTTON

- GENERAL NOTES:**
- SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
- CONSTRUCTION NOTES:**
- ALL RELAYS SHALL HAVE L.E.D.S.
 - ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
 - AT THE INTEGRATORS OPTIONS, PERMISSIVE ALARM SEQUENCES CAN BE INCLUDED WITHIN THE VFD PROCESSOR. VFD CONTROLS SHALL BE COORDINATED WITH ALL EXTERNAL INSTRUMENTS AND SEQUENCED EQUIPMENT FOR PROPER OPERATIONS.
- ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):**
- REMOTE
 - AT PLC CABINET
 - △ AT LOCAL PANEL
 - ▲ AT MOTOR CONTROL PANEL (VFD)
 - ⊙ PANEL BOARD
 - ⊙ AT SYSTEM CONTROL PANEL
- ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):**
- PANEL WIREWAY TERMINATIONS
 - WIRING CONNECTIONS
 - REMOTE TERMINATIONS
 - PANEL CONNECTIONS
 - - - REMOTE CONNECTIONS
 - ⊕ POWER SUPPLY CONNECTION

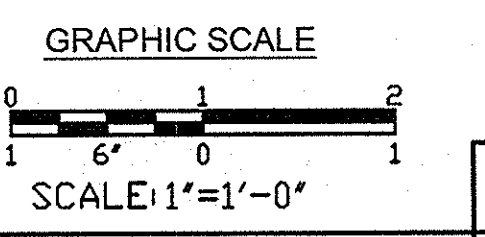
A PCP VFD CONTROL PANEL ELEVATION
 1-9 TYPICAL OF: (INFLUENT PUMP VFD-2)
 SCALE: 1"=1'-0"

NOTE:
 VFD CONTROLS INCLUDING SEAL WATER AND RUN DRY PROTECTION INTEGRATION SHALL BE APPROVED BY THE PUMP MANUFACTURER TO MAINTAIN EQUIPMENT WARRANTY.



1 INFLUENT PUMP VFD (PCP-1)
 1-9 TYPICAL OF: (PCP-2)

AS-BUILT
DATE 12/2021



Jun 16, 2020 - 12:13pm User: Jordan.walsh
 AL:\2020\0107\378\65\Drawings\1-09 ECD.dwg

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

James E. Butler 2/17/21
 CHIEF, BUREAU OF ENGINEERING
 DATE 2/17/21

Thomas E. Butler 2/17/21
 CHIEF, UTILITY DESIGN DIVISION
 DATE 2/17/21

KCI TECHNOLOGIES
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936 ROXBOROUGH ROAD
 SUITE 200
 SPRINGFIELD, MARYLAND 21152
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 FAX: (410) 316-7818
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PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 33925 EXPIRATION DATE: 07/15/21

STATE OF MARYLAND
ENGINEER
10/24/16

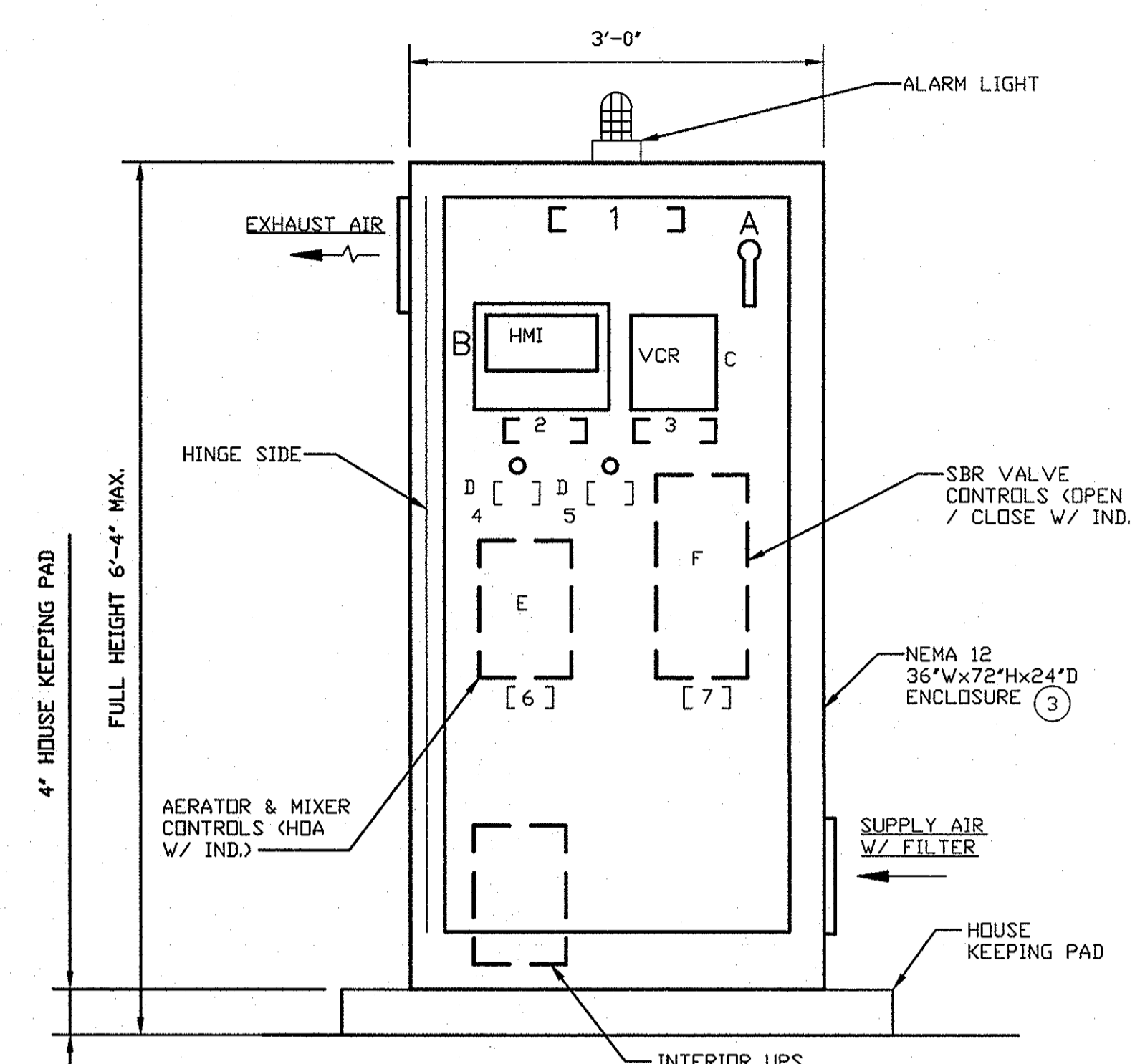
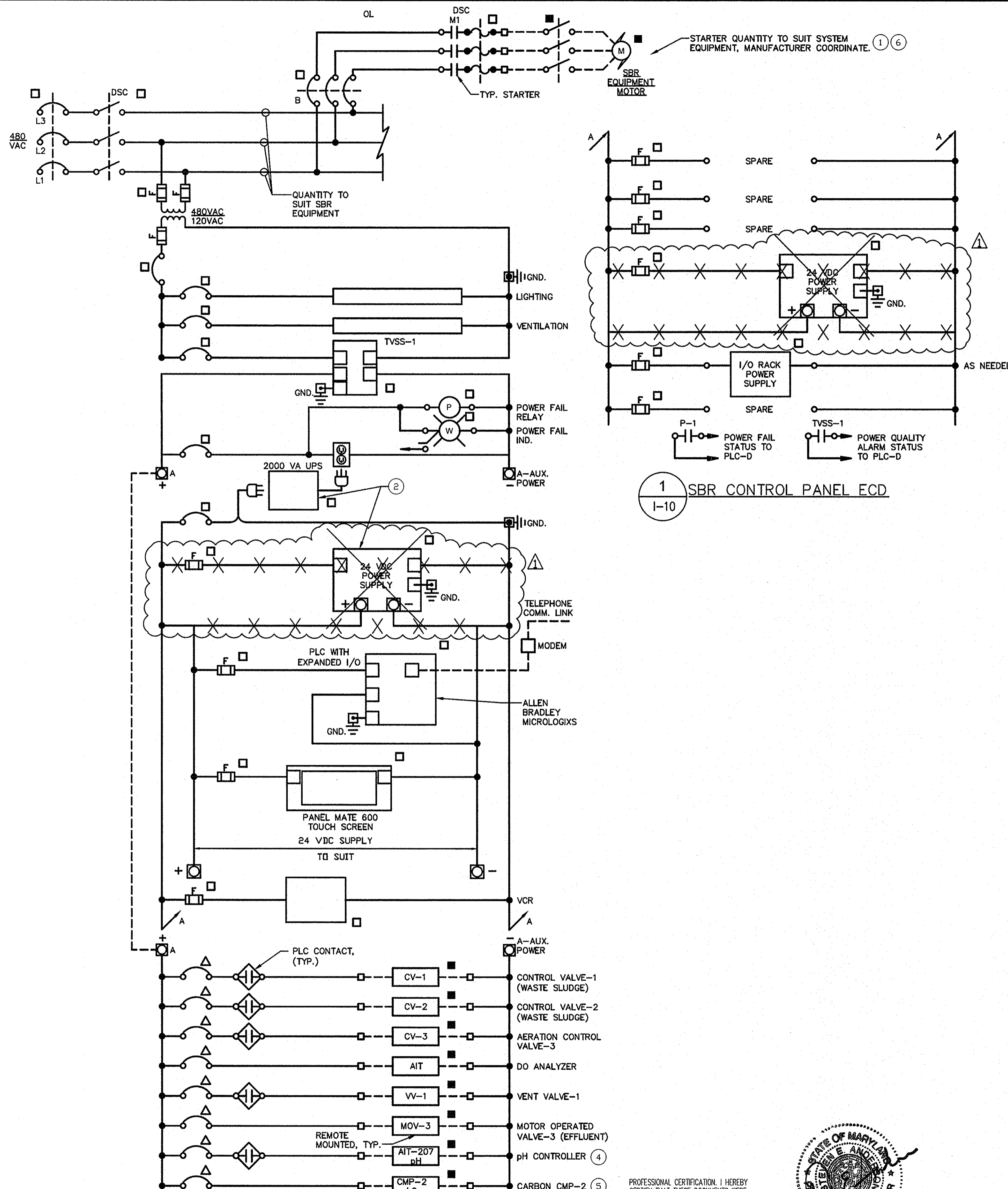
DES:	JFW
DRN:	JFW
CHK:	SEA
DATE:	NOVEMBER 21, 2018
AUG, 2016	
BY:	
NO.	
REVISION	
DATE	

WIRING DIAGRAM - 2

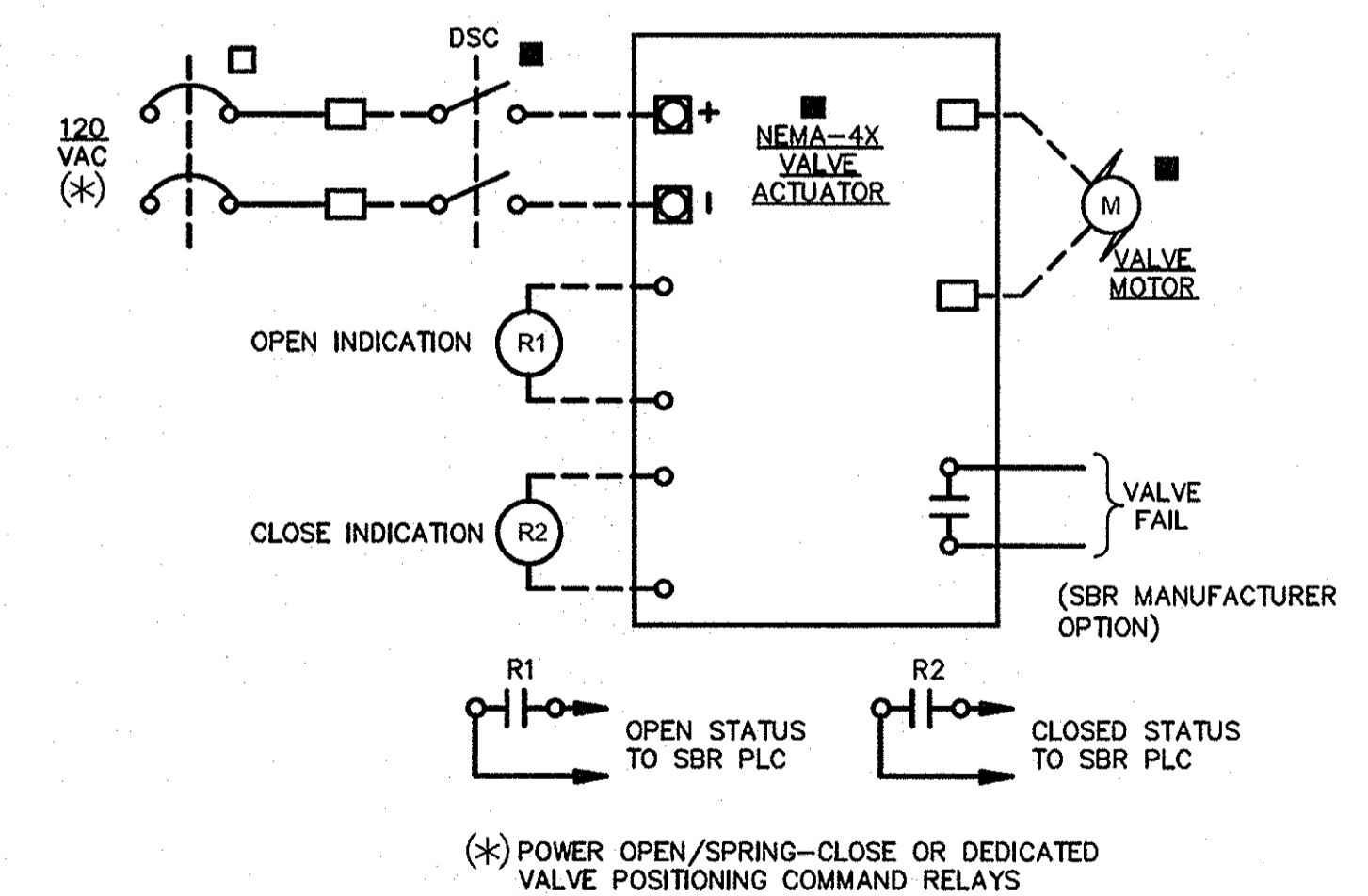
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-9
 SCALE AS SHOWN
 SHEET
 39 OF 43



- NAMEPLATE LEGEND:**
- 1 SBR CONTROL PANEL
 - 2 SYSTEM SCREEN
 - 3 PROCESS RECORDER
 - 4 RESET
 - 5 ACKNOWLEDGE
 - 6 SBR EQUIPMENT
 - 7 SBR CONTROL VALVES
- DEVICE LEGEND:**
- A MAIN PANEL BREAKER
 - B HMI TOUCH SCREEN
 - C VIDEO CHART RECORDER
 - D MOMENTARY PUSH-BUTTON
 - E AERATOR / MIXER CONTROLS
 - F VALVE CONTROLS



GENERAL NOTES:

1. SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.

CONSTRUCTION NOTES:

- (1) ALL RELAYS SHALL HAVE L.E.D.S.
- (2) ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):

- REMOTE
- AT PLC CABINET
- △ AT LOCAL PANEL
- ▲ AT MOTOR CONTROL PANEL (VFD)
- ⊠ PANEL BOARD
- ⊙ AT SYSTEM CONTROL PANEL

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):

- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- PANEL CONNECTIONS
- - - REMOTE CONNECTIONS
- + POWER SUPPLY CONNECTION

NOTES

- (1) INDIVIDUAL STARTER ALARMS IDENTIFIED ON THE P&I'S SHALL BE TERMINATED FOR COUNTY USE AS SHOWN.
- (2) SBR MANUFACTURER SHALL CUSTOMIZE THE BACKUP POWER AND I/O MODULE POWER/ISOLATION RELAYS TO SUIT PLC EQUIPMENT PROVIDED.
- (3) THE SBR CONTROL PANEL ELEVATION DETAILS MINIMUM LAYOUT AND INDICATIONS REQUIRED FOR OPERATOR INTERFACE AND FACILITY HMI. RESPECTIVE MANUFACTURER'S SHALL CUSTOMIZE THIS PANEL TO SUIT THEIR SYSTEM COMPONENTS.
- (4) SBR POWER SHALL BE FURNISHED TO THE ANALYZER HOA/RECEPTICAL PANEL, SEE SHEET I-11 DETAILS.
- (5) SBR POWER SHALL BE FURNISHED TO THE CARBON METERING PUMP HOA/RECEPTICAL PANEL, SEE SHEET I-11 DETAILS.
- (6) SBR MANUFACTURER SHALL PROVIDE EQUIPMENT LABELS FOR ALL BREAKERS.

AS-BUILT
DATE 12/2021

Jun 16, 2020 - 12:24:00pm User: Jordan.wolf
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John A. ... 2/6/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Butler 2/6/17
CHIEF, BUREAU OF ENGINEERING DATE

... 2/8/17
CHIEF, UTILITY DESIGN DIVISION DATE

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... 10/24/16
PROFESSIONAL ENGINEER

DES: JFW
DRN: JFW
CHK: SEA
DATE: AUG, 2016

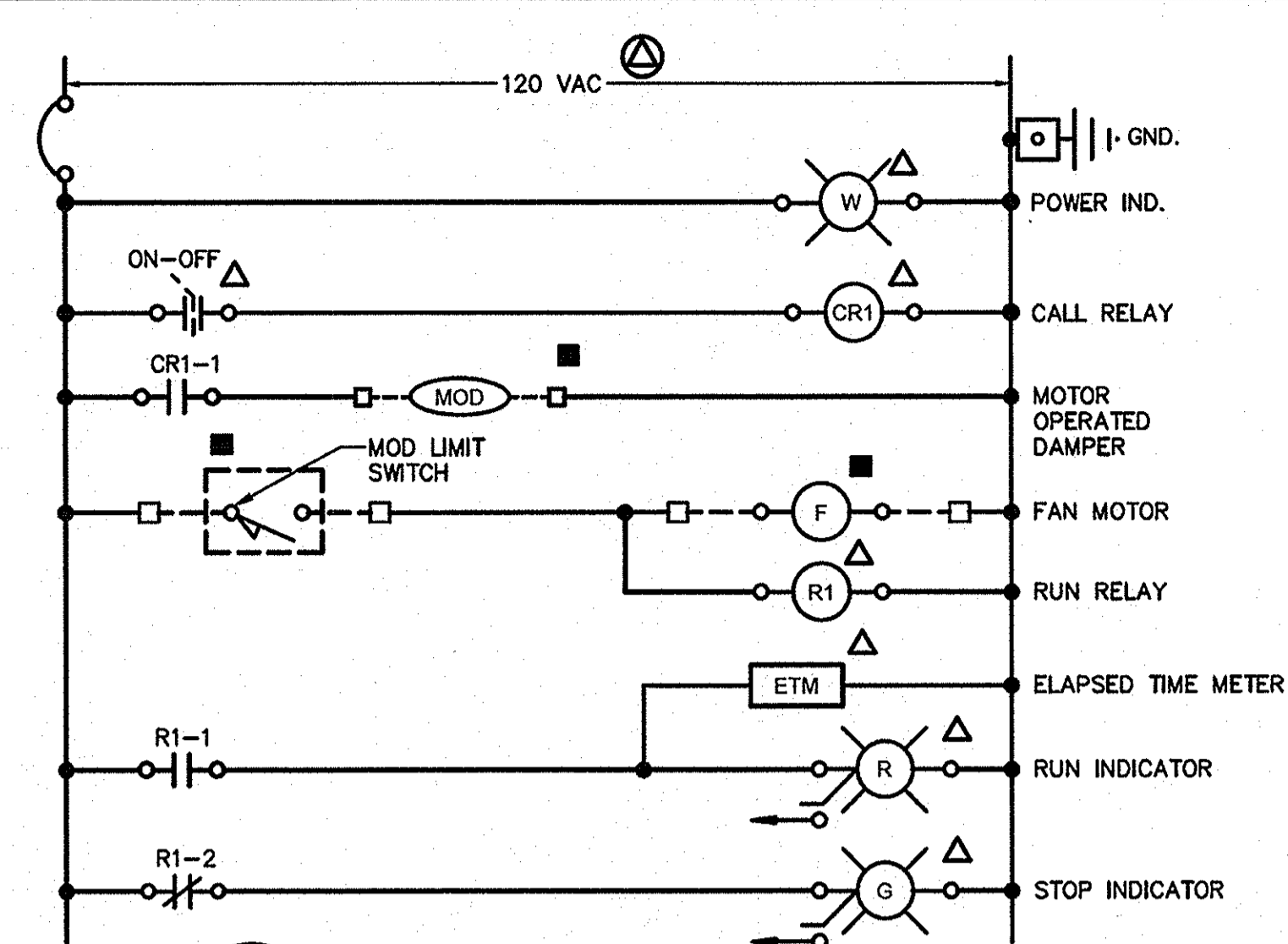
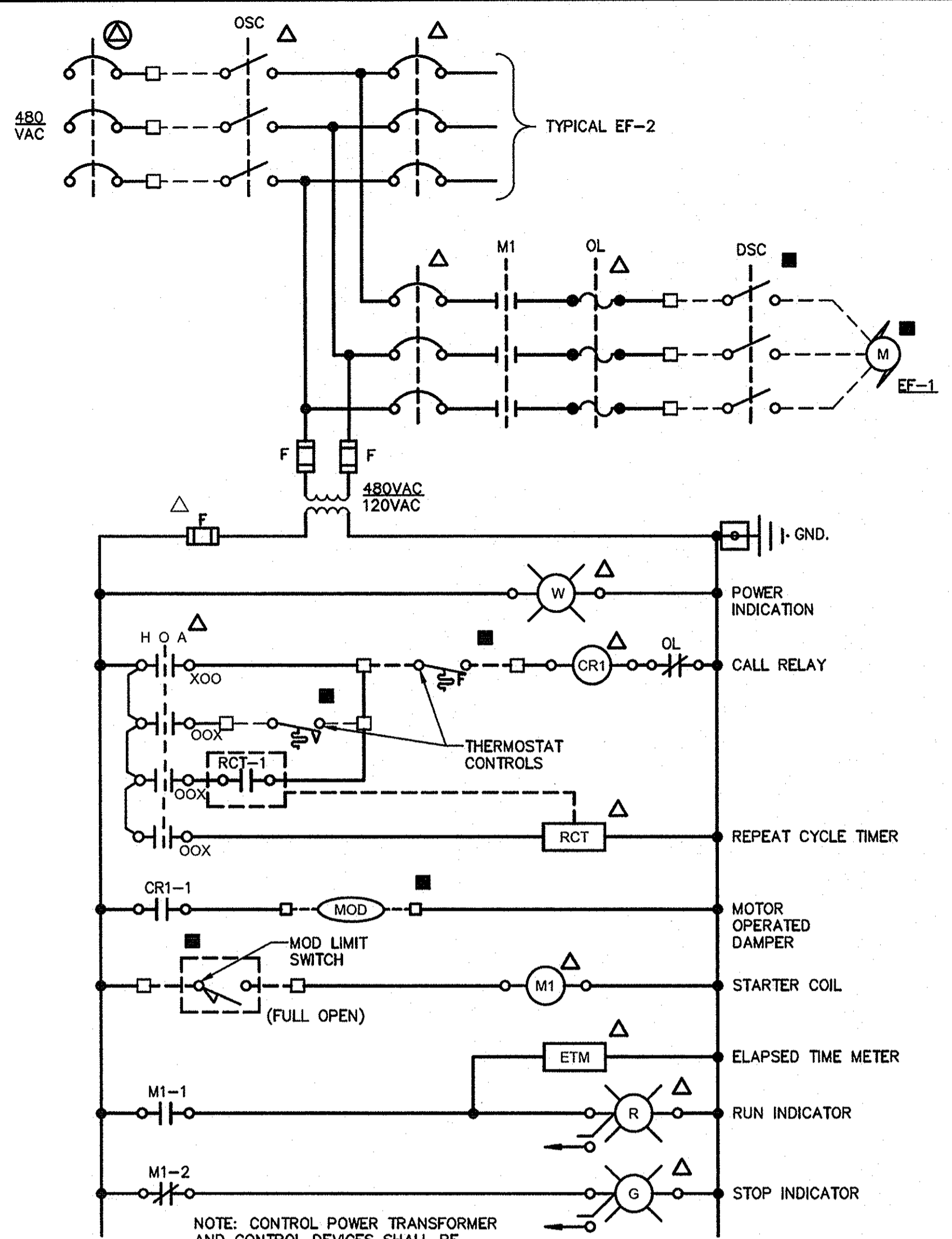
GW
BY NO. NOVEMBER 21, 2018
REVISION

WIRING DIAGRAMS-3

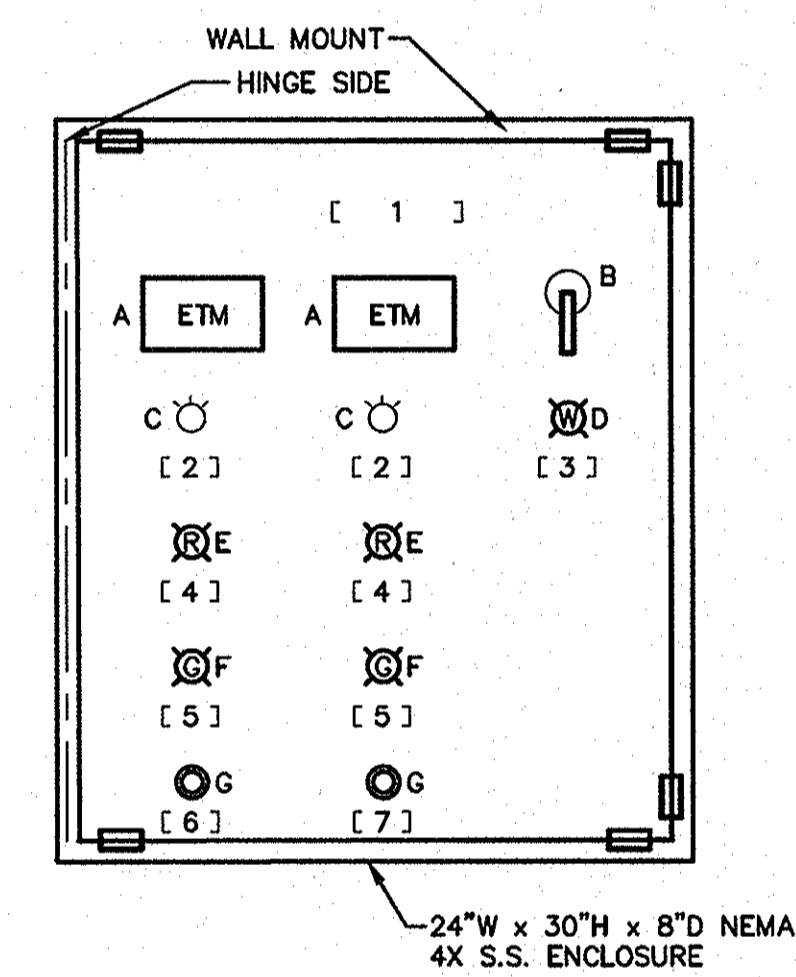
DATE 60" SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-10
SCALE
AS SHOWN
SHEET
40 OF 43

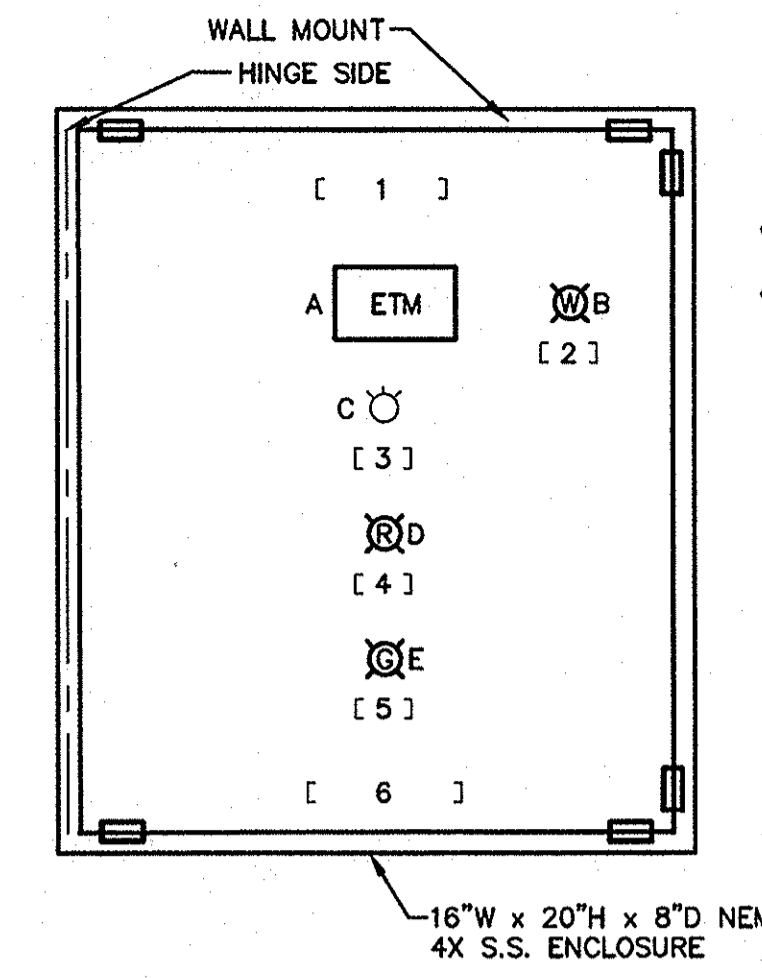


3-12 VCP-4 (EF-3) FUME CONTROL ECD



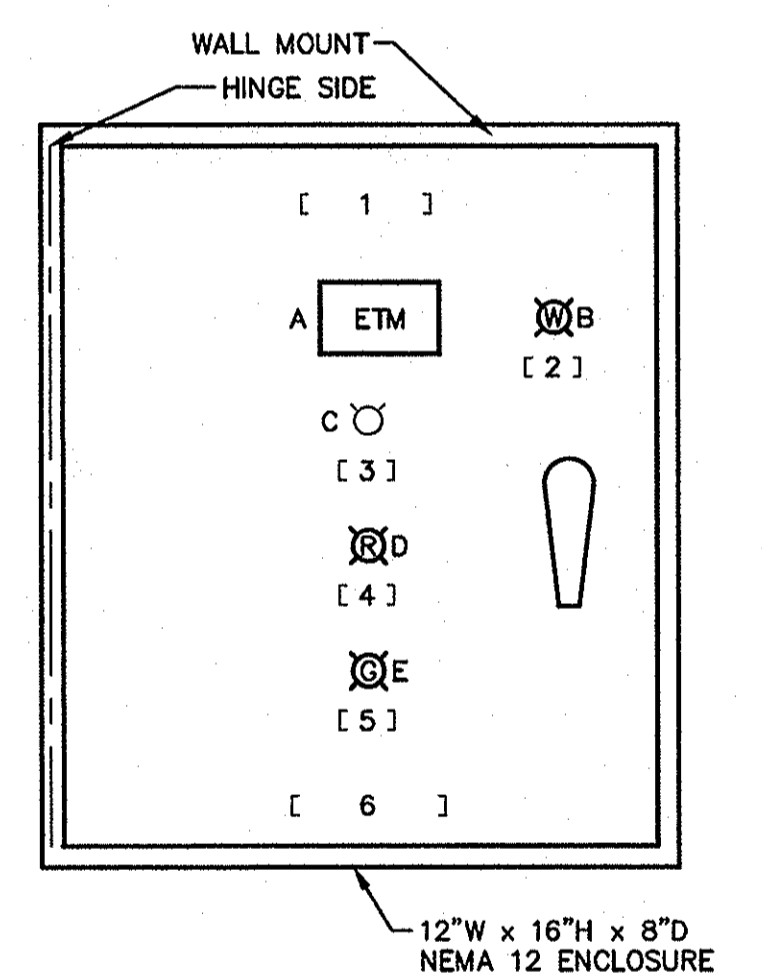
- DEVICE LEGEND:**
- A ELAPSED TIME METER
 - B MAIN PANEL DISCONNECT
 - C 3-POSITION SELECTOR SWITCH
 - D INDICATION LAMP (WHITE)
 - E INDICATION LAMP (RED)
 - F INDICATION LAMP (GREEN)
 - G STARTER OL-PUSH BUTTON
- NAMEPLATE LEGEND:**
- 1 VENTILATION CONTROL PANEL
 - 2 HOA
 - 3 POWER
 - 4 RUN
 - 5 STOP
 - 6 EXHAUST FAN-1
 - 7 EXHAUST FAN-2

A-12 VCP-1 ELEVATION



- GENERAL NOTES:**
- SEE SYSTEM P&ID DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
 - ALL RELAYS SHALL HAVE L.E.D.S.
 - ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
- CONSTRUCTION NOTES:**
- ALL RELAYS SHALL HAVE L.E.D.S.
 - ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
- DEVICE LEGEND:**
- A ELAPSED TIME METER
 - B INDICATION LAMP (WHITE)
 - C 3-POSITION SELECTOR SWITCH
 - D INDICATION LAMP (RED)
 - E INDICATION LAMP (GREEN)
- NAMEPLATE LEGEND:**
- 1 VENTILATION CONTROL PANEL
 - 2 POWER
 - 3 HOA
 - 4 RUN
 - 5 STOP
 - 6 FAN I.D. (VARIES)

B-12 TYPICAL SINGLE PHASE VCP-2 & 3 ELEVATION

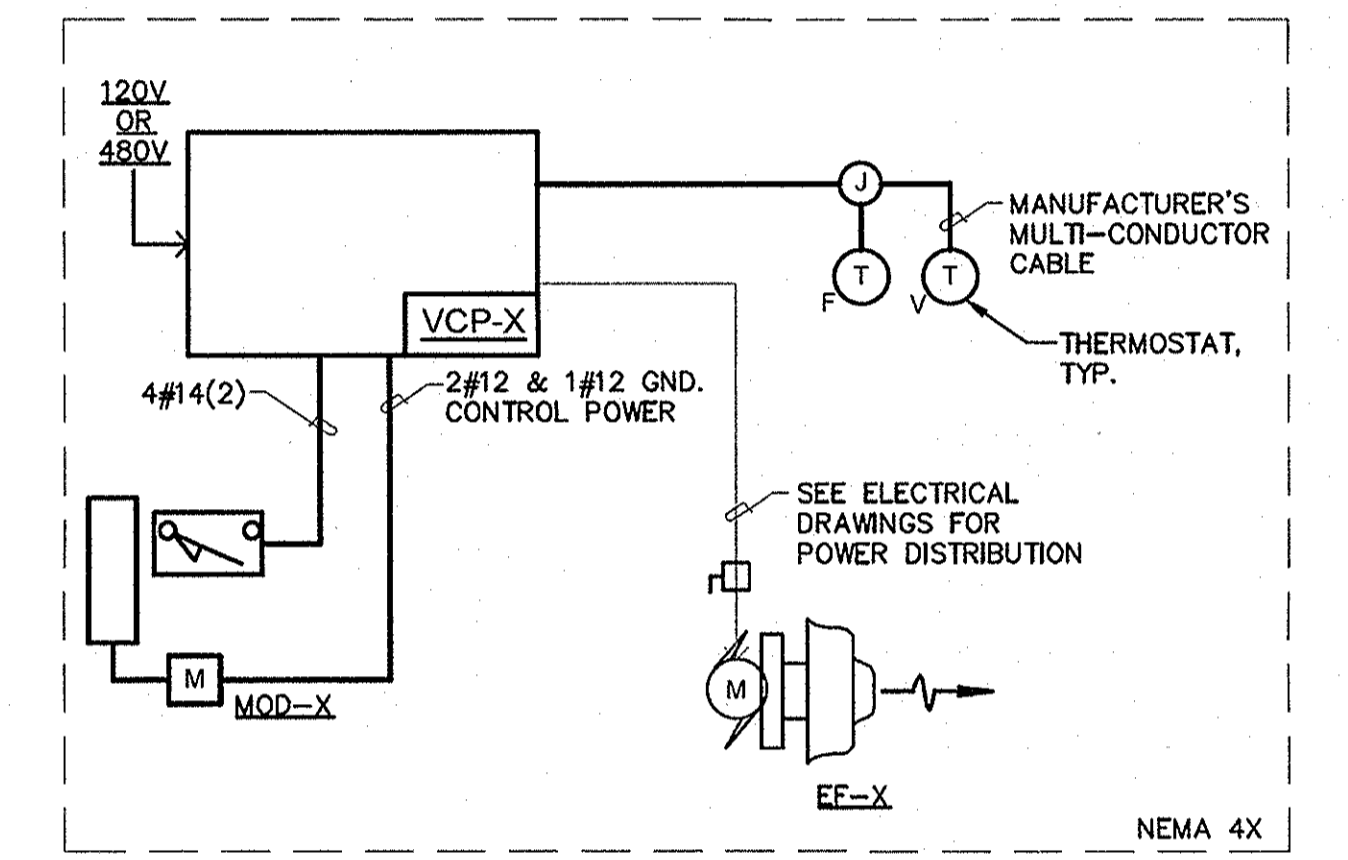


- DEVICE LEGEND:**
- A ELAPSED TIME METER
 - B INDICATION LAMP (WHITE)
 - C 2-POSITION SELECTOR SWITCH
 - D INDICATION LAMP (RED)
 - E INDICATION LAMP (GREEN)
- NAMEPLATE LEGEND:**
- 1 FUME CONTROL VENTILATION
 - 2 POWER
 - 3 ON-OFF
 - 4 RUN
 - 5 STOP
 - 6 EXHAUST FAN-3

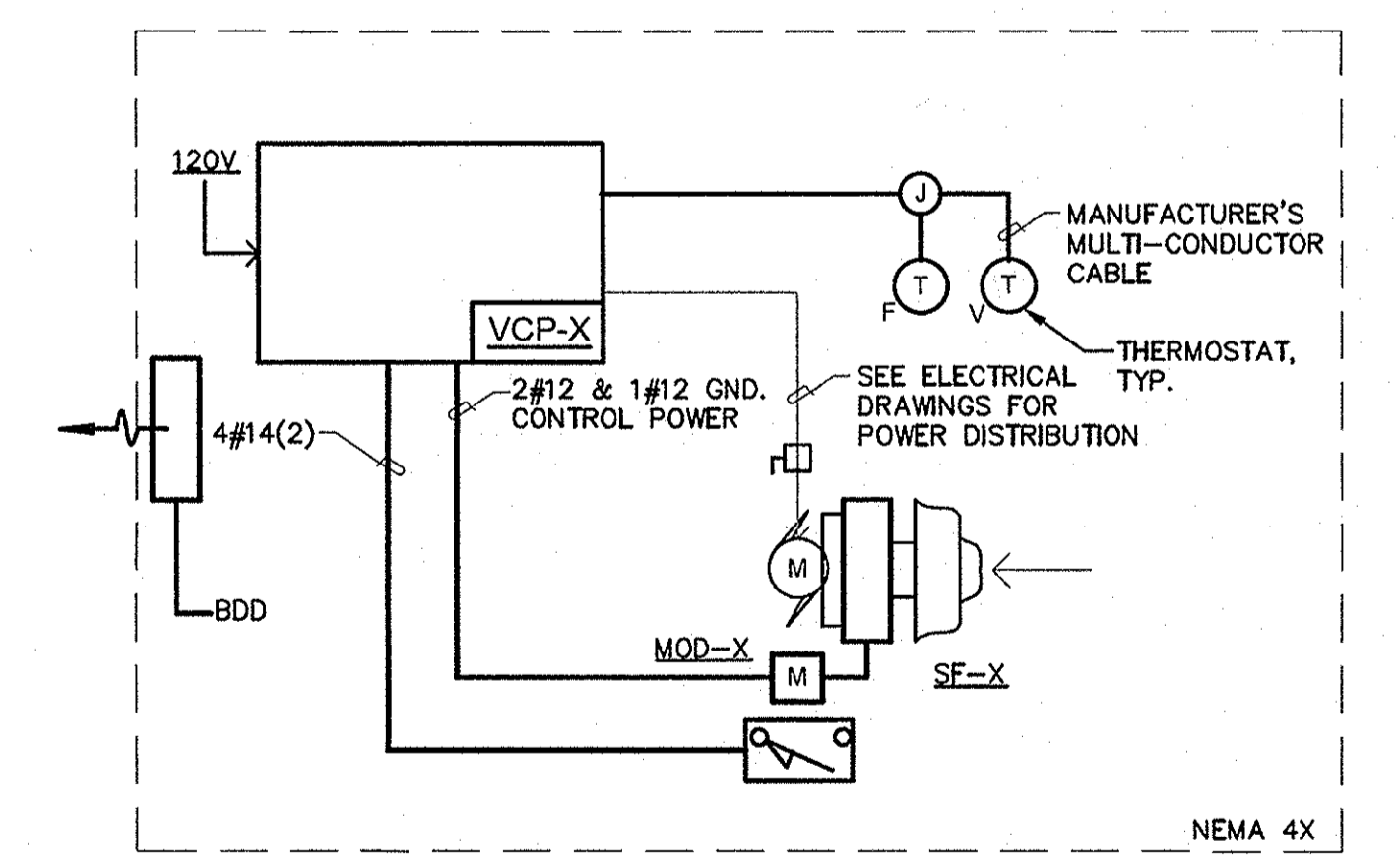
C-12 FUME CONTROL VCP-4 ELEVATION

- ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):**
- REMOTE
 - AT PLC CABINET
 - △ AT LOCAL PANEL
 - ▲ AT MOTOR CONTROL PANEL (VFD)
 - ⊙ PANEL BOARD
 - ⊕ AT SYSTEM CONTROL PANEL

- ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):**
- PANEL WIREWAY TERMINATIONS
 - WIRING CONNECTIONS
 - REMOTE TERMINATIONS
 - PANEL CONNECTIONS
 - - - REMOTE CONNECTIONS
 - ⊕ POWER SUPPLY CONNECTION



D-12 TYPICAL EXHAUST RISER DIAGRAM (SIMILAR NEMA-12 ARRANGEMENT FOR THE FUME CONTROL SYSTEM)



E-12 TYPICAL SUPPLY RISER DIAGRAM

AS-BUILT
DATE 12/2021

DATE PLOTTED: 01/13/2021 11:28:05 AM

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/1/17
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 1/25/17
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/1/17
CHIEF, UTILITY DESIGN DIVISION DATE

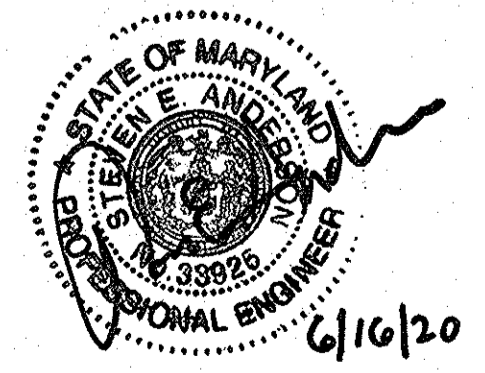
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PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33925, EXPIRATION DATE: 01/21/2021

[Signature] 6/16/20
PROFESSIONAL ENGINEER

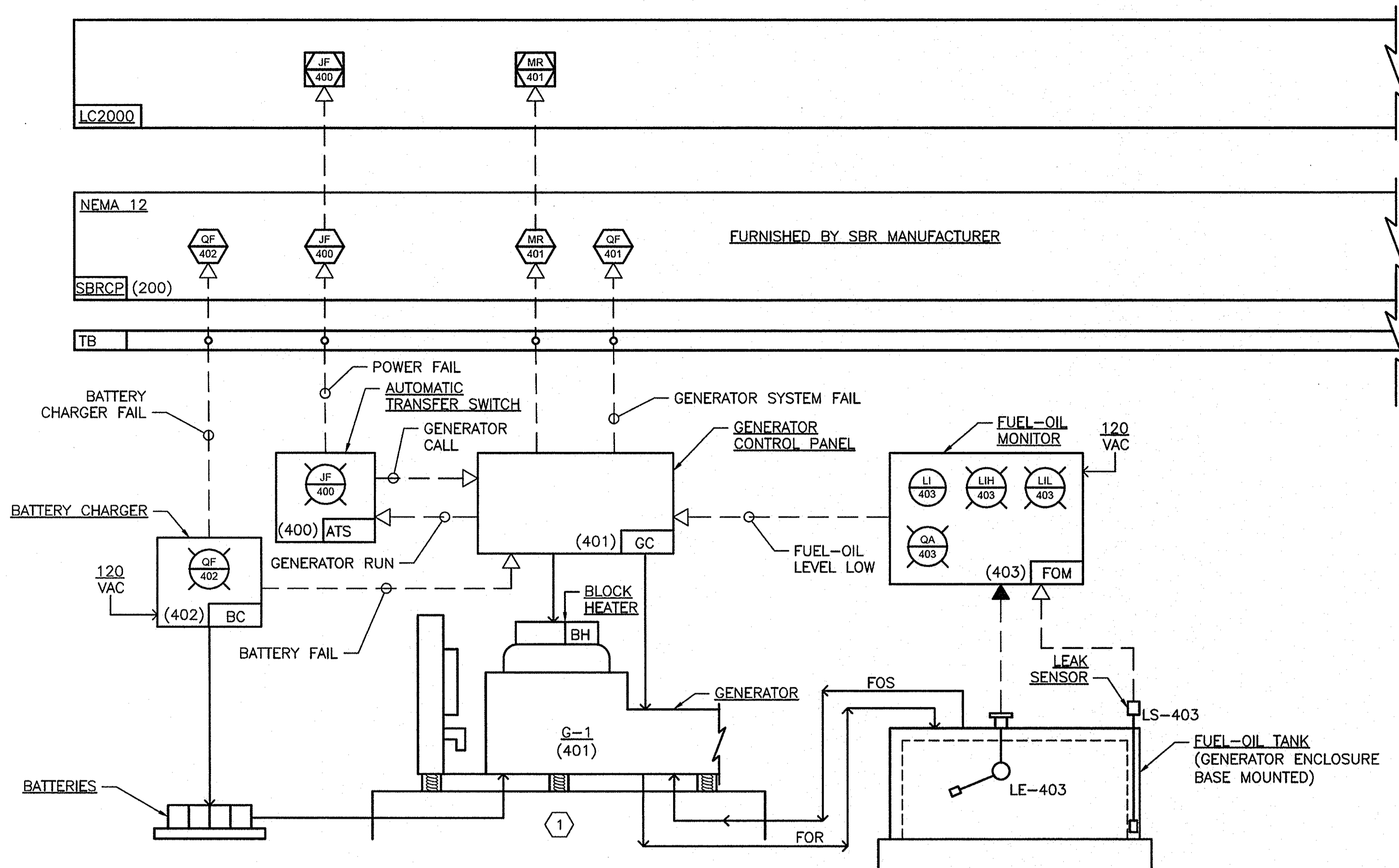


DES: JFW					
DRN: JFW					
CHK: SEA					
DATE: AUG, 2016	BY	NO.	REVISION	DATE	600' SCALE MAP NO. 40-41 BLOCK NO. 12

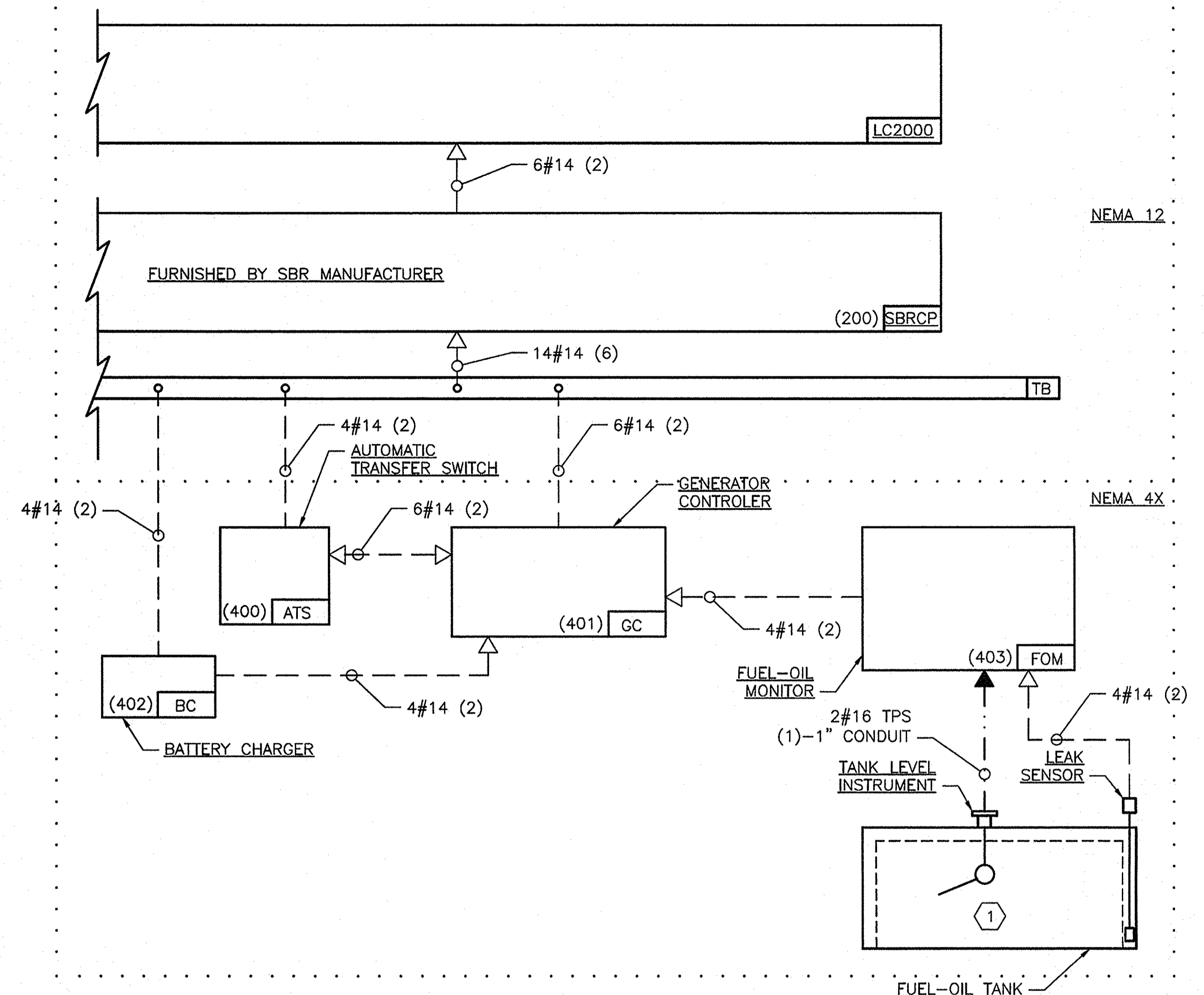
VENTILATION CONTROLS

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-12
SCALE AS SHOWN
SHEET
42 OF 43



1 GENERATOR SYSTEM - P&ID
1-13 SCALE: NONE



2 GENERATOR SYSTEM - RISER DIAGRAM
1-13 SCALE: NONE

GENERAL NOTES:

1. PROVIDE 24-INCHES SLACK WIRE AT EACH END OF ALL SPARE INSTRUMENTATION WIRES.
2. SEE SYSTEM P&ID DIAGRAMS AND ECD DETAILS FOR CONTROL WIRE IDENTIFICATIONS.
3. CONDUIT CONTAINING #16 STP (4-20mA) WIRE SHALL BE LOCATED 6-INCHES (MINIMUM) AWAY FROM CONDUIT CONTAINING POWER CONDUCTORS AND CONDUIT CONTAINING #14 OR #12 POWER AND DIGITAL SIGNAL WIRE.
4. ALL CONDUIT SHALL BE 3/4-INCH IN SIZE UNLESS OTHERWISE NOTED ON INSTRUMENT RISER DIAGRAMS.
5. SYSTEM INTEGRATOR SHALL VERIFY ALL APPROVED EQUIPMENT AND TERMINATIONS PRIOR TO INSTALLATION. THE SYSTEMS INTEGRATOR SHALL VERIFY ALL WIRE COUNTS AND INCLUDE SPARES AS SHOWN HERE IN AND ASSEMBLE INSTRUMENT RISERS FOR CONSTRUCTION. THE RISERS SHALL BE SUBMITTED FOR APPROVAL AS A SHOP DRAWING.
6. SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SIGNAL CONDUIT QUANTITIES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. SEE I-001 FOR EQUIPMENT AND PANEL DESIGNATION.

CONDUIT LEGEND:

- A#14-B (C)
- A - QUANTITY OF CONDUCTORS
 - B - SIZE OF CONDUIT (LARGER THAN 3/4-INCH)
 - C - QUANTITY OF SPARE CONDUCTORS INCLUDED IN TOTAL COUNT (ITEM-A)

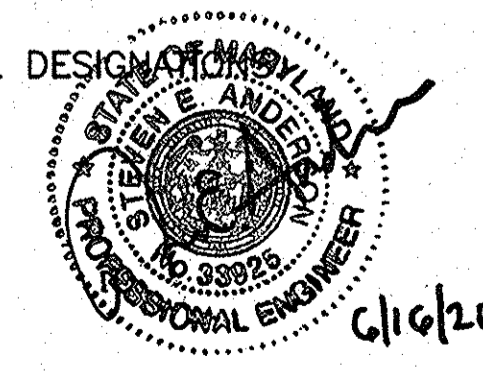
LEGEND:

- I&C DEVICES
- - - DIGITAL COMMUNICATIONS
- ELECTRICAL
- · - · I&C ANALOG COMMUNICATIONS
- · · · · CLASSIFICATION BOUNDARY

SHEET KEY NOTES:

- ① GENERATOR AND FUEL-OIL STORAGE ARE ACOUSTICAL ENCLOSURE MOUNTED AS A PACKAGE.

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AS-BUILT
DATE 12/2021

Jun 16, 2020, 12:46pm User: jordan.wolf

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John A. ... 2/6/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Butler 2/6/17
CHIEF, BUREAU OF ENGINEERING DATE

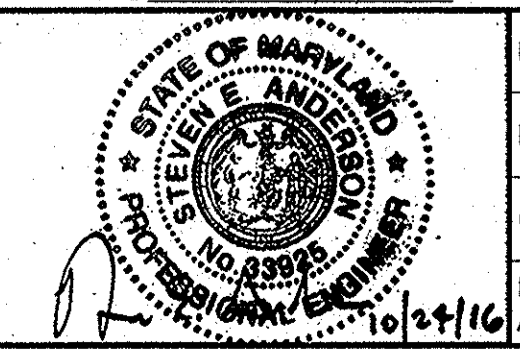
... 11/25/10
CHIEF, BUREAU OF UTILITIES DATE

... 2/8/17
CHIEF, UTILITY DESIGN DIVISION DATE

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DES: JFW					
DRN: JFW					
CHK: SEA					
DATE: AUG, 2016	BY	NO.	REVISION	DATE	600' SCALE MAP NO. 40-41 BLOCK NO. 12

GENERATOR CONTROLS

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-13
SCALE
AS SHOWN
SHEET
43 OF 43